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Rehabilitation of the Amputee

Hormone Therapy of Advanced Cancer of the Breast

Hypoparathyroidism: A Case Report

Care of the Pregnant Diabetic

Incidence of Types of Cardiac Deaths

The Treatment of Pemphigus Vulgaris

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JANUARY, 1950 Volume LXX, No. 1

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Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials; title of article; name of periodical; volume, page and year. Reprints are prepared on order.

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Minneapolis, Minnesota
January, 1950

Vol. LXX, No. 1
New Series

Rehabilitation of the Amputee

Glenn Gullickson, M.D.* and Frederic J. Kottke, M.D.*
Minneapolis, Minnesota

For centuries amputations of the extremities have been performed for the purpose of reducing invalidism, to remove useless extremities, and to save lives.

Interest in the amputee problem has always been stimulated by wars. However, prior to the first World War, interest was chiefly in surgical technique and the construction of more functional prostheses. Rehabilitation of the amputee was of secondary consideration; and consisted essentially of telling the amputee, following surgery, to wait until the stump had "shrunk" and then to see a leg fitter.[1] It was during the first World War that the medical profession began to realize that there was more to the treatment of the amputee than just surgery and the obtaining of an artificial limb. The exigencies of war forced us to concentrate on the problems of amputation en masse. It was found that amputees could be treated best in centers that specialized in the problems peculiar to the amputee. Rehabilitation was recognized as a medical problem; the patient was no longer discharged as well when he could leave his hospital bed, but rather active therapy was given until he was ready to return to work.

Rehabilitation encompasses more than just the surgery, the healing processes, the restoration of function, and the fitting of artificial limbs. It must also take cognizance of the psychic trauma, and the necessity for physical, social, and occupational adjustment. For this reason, rehabilitation is not to be considered a specific phase of treatment, but rather a continuous process, which begins at the time of injury and continues until the patient has obtained maximal functional use of his prosthesis and is able to perform the essential activities necessary for daily living and gainful employment.

The problem of amputees in civilian life is a serious one. During the period of World War II, 18,500 members of the armed forces and 80,000 civilians had amputations. It is estimated that 30,000 amputations are performed each year in civilian institutions.[2] From these figures an indication of the magnitude of the amputation problem in civilian practice is apparent. The vast majority of these civilian patients require a program of rehabilitation in order that the maximal amount of recovery may be obtained. It is, of course, unfeasible to segregate civilian patients in special centers as is done in the armed forces. However, much can be done to bring about the maximum rehabilitation of the amputee in so far as is possible with the resources available. The civilian amputee should no longer be neglected following surgery, but rather a definite program of rehabilitation should be instituted for every patient.

The rehabilitation program for the amputee starts with the surgeon, as he is usually the first medical person to come in contact with the patient. One of the most important functions of the surgeon, certainly equal to the performance of the actual surgery, is the preparation of the patient psychologically. Amputation is not only a severe physical trauma, it is also the deepest kind of psychological insult. Proper psychological preparation will counteract the mental shock and despondency which follows an amputation, and which retards the patient's recovery and prevents his putting forth his best efforts to overcome the handicap. During the whole rehabilitation program the psychological approach must be maintained by the personnel who have contact with the patient, continually encouraging him, stimulating his motivation, and instituting a hopeful attitude, with the overall theme that he should not and need not be a cripple.[3]

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Upon the surgeon also falls the responsibility for the stump the patient is to have following amputation. Amputation surgery is not aimed solely at the saving of life nor the improvement of comfort and health, but is directed also toward the creation of a stump which will be useful and comfortable within the prosthesis, or functional and cosmetic in itself if the use of an artificial limb is not anticipated.[4] Therefore, the criterion for good amputation surgery is the stump. The stump should be of the maximal functional length possible, the bone end should be covered with normal skin and subcutaneous tissue which is free from redundancy and sinuses, and presents a linear scar. The muscles and fascia covering the bone end should be just enough to form a band of scar tissue, non-movable and barely palpable. The bone end should be rounded off and free from spurs. The stump must be free from pain and contractures, and it must be formed throughout of healthy tissues which possess a normal blood supply and sensation.[1] Circumstances frequently will not permit the attainment of an ideal stump. However, every effort should be made by the surgeon to attain the ideal as closely as possible.

There are certain elective sites of amputation which by experience have been found best for obtaining a good functional result. These sites should be adhered to as closely as the pathological condition permits.

Lower Extremity Amputations

In the foot and leg the best sites are:

1. Through the metatarsals. The plantar flap should cover the bone ends and leave a dorsal scar.

2. Amputation just above the ankle joint, the Syme's amputation. The heel pad is brought over the distal end of the tibia and fibia, and the scar is anterior. A fully end weight-bearing stump is produced. However, it is not recommended for women because of the unsightliness of the prosthesis.

3. Below the knee amputation. This amputation should be performed 6½ to 7 inches below the tibial articular surface for the best functional result. Longer stumps are contra-indicated because they give rise to increased circulatory disturbances. Stumps as short as 1½ inches can be fitted with a prosthesis, but the minimal length for good function is about three inches.

Above the knee amputations:

1. The Gritti-Stokes amputation. This is a supracondylar osteoplastic amputation, in which the patella is brought posterior and attached to the cut femur, producing an end weight-bearing stump. A disadvantage of this type of amputation is that the stump is too long. The knee joints of the more efficient prostheses require three to four inches of space above them. Since this amputation stump does not give sufficient space, the knee-joint mechanism must be placed outside the knee joint or dropped to a lower level than that of the normal limb.

2. The Callander amputation. This is the amputation of choice in the patient with arterio-sclerotic or diabetic gangrene because there is a lower mortality rate, a decrease in post-operative infection, and better healing. It is also a supracondylar amputation, performed through the tendons so that muscle tissue, which becomes infected easily because of the decreased blood supply in this type of patient, is not incised. Theoretically, it is an end weight-bearing stump, but practically, because of the poor skin and circulatory condition, ischial weight-bearing prostheses are usually required.

3. Mid-thigh amputation. The preferable site is ten to twelve inches below the greater trochanter. As the distance decreases, so also does function. A three-inch stump is the minimum distance allowable. For shorter lengths, a disarticulation or amputation through the neck of the femur is recommended.

Upper Extremity Amputations

1. In the hand it is important to save as much tissue as possible, especially of the thumb and index finger. Grafts should be used where indicated in order to obtain the maximal length and function. A badly crippled but painless hand is better than any prosthesis available.

2. Forearm amputations. When no grasp function whatever can be saved in the hand, maximum function will be obtained with a forearm stump and prosthesis. The site of election is two to four inches from the distal end of the radius and ulna. Function decreases as the elbow is approached. If the stump must be less than two inches from the elbow, it is better to do an upper arm amputation two inches above the elbow.

3. Upper arm amputations. The preferred site is two inches above the elbow. Function decreases as the axilla is approached, so that at one inch below the axilla the site of minimal function is reached. All upper extremity scars except in the hand should be terminal, since these stumps are not weight-bearing.

Pre-prosthetic Care and Training

Immediately following surgery, pre-prosthetic care and training is instituted. The first dressing that is applied by the surgeon following amputation is extremely important, since the tissues which become fixed in a relatively few days are still easily arranged to give the desired contour to the stump. The post-operative dressing should be of an elastic adhesive bandage applied longitudinally to the stump in three pieces with as few gauze pads as possible to absorb oozing. An elastic bandage is then applied around the stump in a figure of eight with the firmest turns at the end of the stump. This is the only method of bandaging which will mold the stump tissues and yet not cause constriction which by interfering with venous return will result in edema of the distal end of the stump.[5]

PHYSICAL THERAPY

Immediately following surgery a well-planned regime of physical therapy is instituted. The objects of physical therapy are:

1. To prevent or correct deformity.
2. To provide realignment of the extremity.
3. To establish muscle balance.
4. To increase muscle strength.
5. To maintain normal range of motion.
6. To prepare the stump for the prosthesis.[3]

Because contractures develop so rapidly following immobilization, and since it is far more simple to prevent a contracture than to correct one, very careful attention must be paid to the postoperative position of the stump. It is the obligation of all who have contact with the patient to see that the stump is maintained in the best possible position. In addition, stretching exercises must be carried on daily in all proximal joints to prevent contractures. For below the knee amputees, a posterior gutter splint is often advisable to prevent a knee-flexion contracture. Following an above the knee amputation, the commonest deformity is a contracture of the hip flexors. Therefore the stump should not be placed on a pillow if it can be avoided. If it must be placed on a pillow, it should be for as short a time as possible. As soon as the acute pain has diminished, the patient should turn to the prone position several times a day, or should place a pillow under the buttocks to hyperextend the hips. Abduction and external rotation are prevented with sandbags. For upper extremity amputations, passive movement of the proximal joints through a full range of motion twice a day will prevent contractures.

Exercises are started as soon postoperatively as the patient's condition permits. For the below the knee amputations, quadricep setting exercises followed by active resistance exercises of the quadriceps are always instituted. For above the knee amputations, the adductor magnus and hamstrings have been separated from their insertions so that the consequent muscle imbalance results in a stump which is held in flexion, abduction and external rotation at the hip. The patient must re-establish muscle balance and increase the strength of the adductors and hip extensors. Therefore exercises for these purposes are instituted early. In upper extremity amputation, weakness of the deltoid and triceps usually develops and is prevented by active and resistive exercises.

The normal range of motion of all joints, but particularly the joint just proximal to the stump, are maintained by passive or active motion in the fullest range possible.

Preparation of the stump for the prosthesis is started by the surgeon when the first dressing is applied, as mentioned above. However, much must still be done in order to obtain a stump with minimal edema, maximal shrinkage, firm, well-toughened skin, absence of tenderness, freely movable scars, and a smooth evenly contoured taper.

As soon as possible postoperatively, so-called pressure massage is started. This consists at first of gentle tapping of the dressing over the end of the stump with the hand. As the pain becomes less, the amount of pressure is increased by either the physical therapist or the patient, until eventually the patient can stand a blow from a closed fist or bear weight on the end of the stump.

After the wound is healed, usually at about ten days, whirlpool baths are given, which by the combined effect of heat and massage, aid in the removal of residual stump edema by increasing the circulation. Massage is given where indicated to aid in the removal of edema, prevent adhesions from the scars, and to keep the tissues pliable. The exercise program originally instituted while the patient was in bed is increased and expanded with the starting of mat and resistance exercises to increase the muscle strength and range of motion.

Stump wrapping with four-inch wide elastic bandages, two rolls for the thigh amputee and one roll for the below-the-knee and upper extremity amputee is instituted to bring about maximal shrinkage of the stump. The technique of application is important to insure that the pressure results in a smoothly tapered stump. The bandage is applied so that all loose tissues are bandaged away from the end of the stump. The bandage is carried up to the proximal joint, and the firmest turns are at the distal end. The bandage should always be applied with figure of eight turns, and when bandaged the stump should have a smooth conical shape without bulges. The bandage should be rewrapped two or three times a day, and left on at night. The bandage is worn until the prosthesis is fitted.

Instructions in crutch walking are started as soon as possible, first teaching balancing between chairs or in parallel bars, then with the crutches, with a tripod gait, and finally a swing-through gait. It is important to start crutch-walking immediately, otherwise the patient may use a wheel chair excessively and develop flexion contractures of the hips or knees. Six to eight weeks are required to accomplish the above program and obtain a stump ready to be fitted with a prosthesis. It must be remembered that although a limb may be fitted with a prosthesis, no matter what deformity or condition of the stump is present, such a limb will be held in the position of the deformity once the prosthesis has been fitted. Therefore, it is essential that time be allowed for the pre-prosthetic phase of rehabilitation so that the patient is ready physically and functionally to wear the prosthesis when it is obtained.

PROCUREMENT AND FITTING OF THE PROSTHESIS

When the stump is ready for the limb, the prosthesis should be procured as soon as possible. Otherwise the stump will become flabby, the muscles weakened, and the bones atrophied. The crutch habit may develop. The longer the delay in obtaining a prosthesis, the slower will be the patient's progress in learning its use.[1]

LOWER EXTREMITY PROSTHESES

Function of the lower extremity is essentially weight-bearing, and it can be reproduced quite well by a prosthesis. Prostheses are divided into three types: temporary, provisional, and permanent. There is a difference of opinion concerning the initial prescription of the prosthesis. Some physicians recommend the use of a temporary prosthesis until stump shrinkage is complete since the socket of these prostheses can be changed easily. After the stump is completely shrunk, a permanent prosthesis is ordered. Others recommend the initial purchase of a permanent prosthesis with a provision made to alter the socket as the stump shrinks. The military services used the provisional type prosthesis extensively. It consisted of a basic limb into which various individually molded leather sockets could be fitted. When the patient was ready for discharge from the hospital a permanent prosthesis was provided by the Veterans Administration. Provisional prostheses are unfeasible for civilian institutions, since a large stock of basic limbs must be kept on hand and an experienced limb fitter is necessary to fit them.

Temporary pylons made of plaster-of-paris or leather have a distinct disadvantage, in that they do not meet the mechanical problems of alignment, weight-bearing, and motion, and their use may produce faulty habits difficult to correct when the permanent prosthesis is obtained. It is for these reasons many physicians do not recommend their use. However, in many patients, especially in the older age groups, the use of the temporary prosthesis does have a place. With its use, it is possible to get the patient up earlier, since it takes two or three months to obtain a permanent prosthesis. Also by the use of a temporary prosthesis, it is possible to estimate better whether or not a patient is going to be able to learn not only to walk with an artificial limb, but also whether or not the opposite leg will be able to withstand the added exertion. This is especially true in cases where the original amputation was for peripheral vascular disease or similar disorders. The temporary prostheses are always used with bilateral amputations, since balancing is easier to learn if the patient is first started on short pylons about six inches off the floor, and then increased three to four inches weekly until the desired height is reached.

Permanent prostheses are made of wood, fiber, metal, or leather. The most common type is made of willow wood with a molded leather socket. The component parts of the lower extremity prosthesis are the socket, the knee joint, the shin piece and the foot, which are joined together in proper alignment. They are attached by a thigh cuff in below the knee amputations, and a shoulder strap or a pelvic band in above the knee amputations. The socket is the most important part and must be molded and shaped so that it fits accurately in order to bear weight comfortably and yet not interfere with circulation. Properly fitted sockets should fit in only one position. There should be no wrinkling of the skin in the socket, and the flesh should not roll up nor protrude over the top of the socket. In above the knee prostheses, the knee joint axis is posterior to the line of weight bearing so that when weight is borne there is about five degrees hyperextension. A friction brake or straps are incorporated in the knee joint so that the shin swings forward and is fully extended just at the moment weight is applied on the heel. The foot is fixed in slight equinus so that pressure on the toe causes hyperextension at the knee.

Mention should be made of the suction socket which is coming into favor since no straps are required to hold it onto the stump. At the present time it is only recommended for thigh amputations. The stump should be ten to twelve inches long, measured from the greater trochanter. The socket must be perfectly fitted so that there is absolute unity between stump and prosthesis. For such a socket a cylindrical stump rather than a conical stump is recommended. It is important that the stump have a smooth contour, otherwise air leaks are liable to develop.

UPPER EXTREMITY PROSTHESES

The functions of the upper extremity and hand are grasp and touch. These cannot be replaced adequately by any artificial arm, hence the necessity for conserving as much of the hand as possible. Prostheses are of two types. They are either cosmetic or functional. As yet we do not have a satisfactory functional cosmetic hand. As a consequence, arm amputees are often supplied with both a cosmetic and a functional prosthesis.

The functional type of prosthesis which is most useful is the utility or split-hook type. The mechanical hand which cosmetically is better than the split-hook has only opposition of the thumb and forefingers and the grip is poor. Both the utility hook and the cosmetic hand are opened by means of cords to the opposite shoulder. Cineplastic operations whereby tunnels are made through muscle bundles and the straps of the hook or hand are attached to pegs passed through these tunnels, are a recent development in this country. The use of this type of operation is still being developed and more time is required to determine its effectiveness.

POST-PROSTHETIC TRAINING

The process of learning to use the prosthesis requires time. The amputee needs careful guidance in order to obtain maximal function. It is not enough just to fit the prosthesis and then discharge the patient after an hour or two of instruction.

The first thing that the amputee must learn is the care of the skin, since when skin disorders begin use of the prosthesis ceases.[6] The stump must be washed daily with soap and water. No oily or greasy substances should be used, since they soften the skin and frequently lead to furunculosis. Frequently talcum powder adds to the patient's comfort. The patient should wear a stump sock of virgin wool, or cotton if he is allergic to wool. The sock should be laundered daily. Any contusions or infections should be treated promptly and properly, and the prosthesis not worn during their presence.

Lower extremity amputees must be taught to walk. There are a number of component parts to good walking. Balance, even weight distribution, muscle co-ordination, rhythm and equal length in steps. Gait-training proceeds in the following order: balancing exercises in parallel bars or between chairs, weight-shifting exercises, leg-raising exercises, and finally, walking exercises with constant emphasis on obtaining a normal gait pattern. Crutches are to be avoided if possible. Canes are permissible but should be dispensed with as soon as possible. When the patient has an even walking pattern, he is then taught how to fall, how to get up from the floor, and how to climb stairs. The patient must be conditioned psychologically to the fact that he cannot expect his limb to compare favorably with the normal leg.

For upper extremity amputations, after learning to use the opposite shoulder to open the hook, training consists of teaching the patient the many activities and functions possible with the prosthesis.

Occupational Therapy

Occupational therapy is an integral part of the rehabilitation process. Early, diversional occupational therapy is given to help prevent the despondency which often occurs. Later, after the prosthesis has been obtained, functional occupational therapy is given to help attain coordination and strength. In the case of lower extremity amputees, the use of the looms, bicycle saws, sanders, printing press, and other leg-operated machines are employed. For upper extremity amputations, occupational therapy provides the training to develop dexterity in the many functions that it is possible to perform with the prosthesis—how to use a knife and fork, button buttons, tie shoe laces, use various tools, and carry out functional activities necessary for daily living. The occupational therapy department may also give prevocational training to certain selected patients when indicated.

Vocational Rehabilitation

When the patient has been fitted and taught the maximal function available from the use of his prosthesis, vocational rehabilitation is indicated, if he is still within the wage-earning age group and his disability is such that he cannot return to his former occupation. The State Division of Vocational Rehabilitation is consulted, and the patient is given aptitude tests, vocational guidance, and further training as indicated, so that he may be fitted to a position which he is capable of performing with his disability.

In conclusion, it should be emphasized that an over-all program of rehabilitation is necessary to obtain maximum benefit for the amputee so that he can be self-sufficient and self-supporting. Although such an extended program as is used by the Army and Navy is impossible in civilian hospitals, much can be done through cooperation of the surgeon, psychiatrist, limb-maker and vocational counsellor in order to obtain better results in restoring the amputee to a useful, active life. Mitchell has pointed out that the percentage of persons who have undergone amputations returning to almost complete activity is capable of increase, not through the adoption of new methods, but through more efficient application of the principles already known.[7]

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$750,000 GRANT FOR MAYO MEMORIAL CENTER

A $750,000 federal grant has been given to the University of Minnesota Mayo Memorial Medical center, making possible an addition of three stories to the memorial plans, and the construction of a two-story rehabilitation center. The memorial, in honor of the late Doctors Mayo of Rochester, will include a cancer research institute, a public health center, modern operating room and new hospital wards.

According to Dr. Frederic J. Kottke, associate professor and head of the physical medicine division, the new rehabilitation center will seek to "restore the physically handicapped to fullest physical, mental, social and economic usefulness." It will serve some 500 persons a year in addition to 5,000 physical therapy patients from the University hospitals.

Hormone Therapy of Advanced Cancer of the Breast[*]

Stuart W. Arhelger, M.D.
Minneapolis, Minnesota

Carcinoma of the female breast is one of the most frequent causes of death resulting from malignancy. In spite of the gradual improvement in the five year clinical survival rates [14,33] the annual death rate approaches 16,000. Recurrences after initial radical mastectomy are common, and there is a large group of patients who present advanced, inoperable or distant metastatic disease requiring palliative management. Irradiation therapy offers definite but restricted palliation in certain cases the results of which are well recognized.[12,30] More recently it has become well established that human breast cancer can be favorably influenced by altering the hormonal status of the host. Castration, as oophorectomy or by x-rays, androgenic, and estrogenic therapy are the three methods currently used to achieve this influence.

Numerous papers have appeared considering the effects of castration or the administration of androgens to persons with advanced inoperable disease,[2,3,4,8,10,11,17,18,20,24,26,28,29,32] with only a few reports dealing with the beneficial effects of estrogenic hormones.[5,9,13,15,16,21,22,25,34] It would seem desirable to review briefly the salient information pertaining to castration and androgenic therapy and to present rather completely data concerning the use of estrogenically active compounds in the management of advanced carcinoma of the breast.

CASTRATION

As early as 1896 Beatson [7] suggested that oophorectomy might be beneficial in certain cases of breast cancer. Studies of effects occurring subsequent to castration have rarely noted any influence on the primary tumor. However, favorable responses manifest by apparent regression of bony metastases, relief of pain, improved general physical status, increased hemoglobin and red cell production and occasionally regression of pulmonary lesions have been reported.[1,24,32] These favorable responses have been confined almost exclusively to premenopausal women. Prophylactic castration, as an adjunct to radical mastectomy, in patients with stage one or stage two disease (confined to the breast or regional nodes) does not appear to be significantly advantageous. Therefore, it is best reserved for premenopausal patients with advanced, recurrent or distant metastatic cancer of the breast. It is estimated that from 15 to 30 per cent of this group will derive benefit from castration.[1,24,32]

ANDROGENIC THERAPY

Experimental studies in laboratory animals have indicated that sex hormones have definite effects on the occurrence of mammary cancer. Numerous investigators stimulated by the researches of Lacassagne,[19] Suntzeff and Loeb,[31] have demonstrated that the administration of estrogenic hormones may produce mammary carcinoma in mice of certain strains. An attempt to counteract this carcinogenic effect of estrogens by the means of androgens seemed to be a logical consequence. Raynaud and Lacassagne,[27] Murlin and others have effectively reduced the incidence of spontaneous mammary cancer in female mice of high cancer strains by the administration of androgens. It seems natural then that androgens would be tried in the treatment of the clinical disease.

Testosterone has been employed clinically by many investigators.[2,3,4,8,10,11,17,18,20,24,26,28,29] It is considered to produce its most obvious effects on osseous metastases and upon the general condition of the patient. The pain of bone lesions may be relieved and there may be recalcification in areas of osteoclastic metastases. Regressions of soft tissue lesions have occurred infrequently. A recent analysis of 300 cases treated by testosterone propionate revealed that roughly 65 to 70 per cent of patients were subjectively improved but only 20 per cent manifest objective improvement as regression of osseous lesions and occasionally pulmonary metastases.[6] In contrast to castration and estrogenic therapy the responses to androgenic therapy do not seem to be prejudiced favorably or unfavorably by the age of the patient. Testosterone propionate administered intramuscularly as 25 to 100 mgm. three times weekly is the method commonly used although other schedules of dosage have been reported as efficacious.[2,3,8,10,17,28,34]

The side effects of androgenic administration include the rather undesirable masculinization of the patient with deepening of the voice and hirsutism (less prominent at the 75 mgm. per week dose level), increase in feminine libido and the variable formation of peripheral edema. One dangerous reaction noted infrequently is the occurrence of hypercalcemia manifest clinically by nausea, vomiting and varying degrees of prostration and coma. Serum calcium determinations taken at intervals during therapy will predict disturbances of calcium metabolism, as significant persistent elevation of the serum calcium level should be considered as contraindication to continued androgenic therapy. Sodium citrate (250 cc. of a 2.5 per cent solution given intravenously) has effectively counteracted acute severe hypercalcemic symptoms when recognized.

Androgenic therapy may be indicated in women of any age with advanced breast cancer exhibiting widespread or more localized skeletal involvement that has not responded to x-ray therapy or in which x-ray therapy is contra-indicated, and occasionally for cases with pulmonary metastases (postmenopausal women with bone lesions have responded to estrogens as well as androgens and with slightly less severe side reaction.)[15,6] It should be emphasized that the presence of osteoclastic metastases in weight bearing areas such as the femoral neck and vertebræ is an indication for localized x-ray therapy to prevent, if possible, pathological fractures, as the relief of pain afforded by hormone therapy is not always accompanied by recalicification of the osteoclastic lesions. An x-ray survey of the skeleton, especially of weight bearing bones, is therefore almost indispensable in the proper selection of therapy and in following the course during treatment.

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Estrogenic Therapy

It has been considered paradoxical by some that both androgens and estrogens, so called biological antagonists, are effective against cancer of the breast. However, there are now many reports establishing the phenomenon of breast cancer regression following the administration of estrogenically active compounds and more recent experience with this method by Huseby and others[15,34] would indicate a definite place for estrogens in the palliative management of postmenopausal patients with advanced disease.

In contrast with the androgens, estrogens have been found to be peculiarly advantageous for soft tissue lesions. The types of lesions which have responded to estrogenic therapy include, primary inoperable breast lesions, recurrent and metastatic lesions of the skin and subcutaneous tissues, lymph node metastases, lung and pleural metastases, and metastases to intra-abdominal organs, peritoneum and mesentery.[1,5,9,10,15,34] Despite early reports that estrogens were ineffective in osseous metastases favorable responses will occur in selected cases.[15] This type of therapy is best limited to patients who are at least five years postmenopausal because of the not infrequent acceleration of tumor growth that may accompany its use in younger women.[5,9,10] The method of therapy used by most investigators and preferred in this clinic has been the continuous oral administration of diethylstilbestrol at 5 mgm. t.i.d., although other stilbene derivatives were used in the initial studies by Haddow et al[9,13] and the naturally occurring estrogens such as ethinyl estradial have been used effectively by Taylor.[34]

The side effects of estrogenic therapy have been relatively mild. Nausea, vomiting and general malaise of moderate severity may be encountered during the first few days of therapy. In the majority of instances these symptoms disappear within a week without interruption of treatment. Surprisingly, "break-through" uterine bleeding is infrequent with the large doses of stilbestrol used. However, withdrawal uterine bleeding of short duration is a common occurrence when stilbestrol is discontinued. The tendency for estrogenic hormones to cause retention of tissue fluid may be manifest by weight gain and varying degrees of peripheral edema. This is particularly important in patients with impaired cardiac function where serious decompensation may be precipitated and is best avoided by restriction of sodium ion and by the administration of a diuretic such as ammonium chloride. Some enlargement of remaining breast tissue is seen regularly and in many cases a progressive pigmentation of the nipple and areola, axillary and perineal skin will be observed. Some patients have complained of an increase in urinary frequency accompanied by urgency and mild incontinence. Hypercalcemia may be a rare complication of estrogenic therapy.

The indications for estrogenic therapy include patients five years postmenopausal or a year after surgical or x-ray castration with unquestionably inoperable primary breast cancer, recurrent or metastatic lesions in other soft tissues such as skin, subcutaneous tissues, lymph nodes, intrathoracic or intra-abdominal viscera in whom x-ray therapy is contra-indicated or inadvisable (irradiation therapy may be used concurrently when indicated). It may be predicted that about 50 per cent of selected cases receiving estrogens will show favorable objective responses, manifest by definite regression of their lesions. A slightly larger percentage of cases will manifest subjective improvement. The objective responses in soft tissues may be quite dramatic. Skin nodules and primary lesions in the breast follow a rather definite pattern. Usually within two or three weeks a definite color change from red to a purple hue is noted, often accompanied by a softening and flattening of the lesion. Following this initial response, which may be accompanied by a measurable decrease in the size of the mass, the lesions may undergo further regression with a darkening of the lesion to a deep brown. If regression is complete, no tumor can be detected clinically at the site although biopsy has usually revealed a cryptogenic focus of viable cancer cells.[15] Large foul ulcerated lesions have been seen to completely regress and epithelialize. Pulmonary metastases have disappeared as followed by serial x-ray examinations and pleural effusions have been re-absorbed. Osseous lesions may remain stationary, progress or regress. When regression occurs it is by recalcification of bone and is observable by x-ray study. Subjective responses include a frequent increase in feeling of well being (less prominent than with androgens), relief of dyspnea as lung lesions improve and at times a striking relief of bone pain. In a series of 31 cases reported by Huseby and Arhelger[15] 17 had definite or complete regression of their lesions (Tables I, II and III). In this study a response was considered as favorable only if there was a complete clinical disappearance of the lesions or definitely measurable diminution in their size which then remained stationary for an appreciable period of time.

The rate of regression of lesions and the latent period before response have been variable factors. In some instances as long as twelve months have elapsed before regression was complete although many cases have regressed their lesions to a clinically indetectable state within a few weeks, while others have undergone partial

TABLES I, II AND III*

A Tabulation of the Response of Lesions According to Their Location

(Regression of lesions occurred in 17 of the 31 patients treated with diethylstilbestrol in the University of Minnesota Hospitals Tumor Clinic as followed through December 1948.)

TABLE I

Primary breast lesions; metastases to skin, subcutaneous tissues, and superficial nodes

Case	Duration of Rx	Duration of Regression	
Instances of Definite Regression			11
1	11 mo.	14 mo., no reactivation	
2	11 mo.	7.5 mo., then reactivation	
3	5 mo.	6 mo., exp. with bone lesions	
4	22 mo.	22 mo., no reactivation	
5	9 mo.	6 mo., exp. at 11 mo.	
6	9 mo.	6 mo., then grad. progression	
7	8 mo.	6 mo., then reactivation	
8	9 mo.	9 mo., no reactivation	
9	19 mo.	32 mo., no reactivation	
10	13 mo.	11 mo., then grad. progression	
11	9 mo.	6 mo., then reactivation	
Instances of No Appreciable Regression			10
Total			21

TABLE II

Lung and Pleural Metastases

Case	Duration of Rx	Duration of Regression	
Instances of Definite Regression			6
1	9 mo.	13 mo., no reactivation	
2	11 mo.	7.5 mo., reactivation (exp.)	
3	19 mo.	19 mo., no reactivation	
4	11 mo.	11 mo., no reactivation	
5	9 mo.	9 mo., no reactivation	
6	11 mo.	10 mo., then reactivation	
Instances of No Appreciable Regression			5
Total			11

TABLE III

Bone Metastases

Case	Duration of Rx	Duration of Regression	
Instances of Definite Regression			2
1	12 mo.	11 mo., then reactivation expired at 19.5 mo.	
2	22 mo.	22 mo., no reactivation	
Instances of No Appreciable Regression			4
Total			6

Metastases to Mesentery and Retina

Case	Duration of Rx	Duration of Regression
Instances of Definite Regression 1 case each		
Mesentery	6 mo.	6 mo., no reactivation (proved by laparotomy)
Retina	9 mo.	9 mo., no reactivation

*Revision of data from Huseby, R. A. and Arhelger, S. W.: Estrogen Therapy of Advanced Cancer of the Female Breast. Bulletin of the University of Minnesota Hospitals, 20:276-291, 1949.

regression and remained static for several months. In our experience lesions continuing to progress during the first twelve weeks of treatment have received no added benefit from further therapy.

Early reports seemed to indicate that the favorable effects of estrogenic therapy were of very short duration.[9,13,16] Although critical analysis of the average duration of response necessarily awaits the collection of more cases and detailed follow-up studies, continued regressions have now been observed for as long as four years. Interestingly, cases in which reactivation of the disease has occurred, have not progressed at a rate noticeably more rapid than that seen prior to the institution of therapy.[15]

CONCLUSIONS

A review of the salient features and indications of hormone therapy of cancer of the breast is presented emphasizing the more recent studies of the beneficial effects of estrogenic hormones. Although at the present time it is impossible to evaluate these methods in terms of prolongation of life, there is little doubt that by the careful utilization of the methods of hormonal alteration some palliation can be offered to many of the unfortunate patients with advanced, recurrent or metastatic breast cancer.

It should be re-emphasized that these measures, useful as adjunctive therapy, are in no sense presented as substitution therapy for surgery or irradiation therapy in those instances where they are of well recognized value.

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NEW PROJECTS IN CANCER RESEARCH

Grants of $907,212 were made by the National Cancer Institute to aid laboratory and clinical research hospitals and universities in 21 states and the District of Columbia.

Several of these institutions will study the relationship of cancer and hormones. Under a grant to Memorial Hospital, New York City, Drs. R. W. Rawson and H. J. Tagnon will investigate the role of human liver in reducing the activity of estrogen, which has been proved capable of inciting cancer in mice. At the University of California, Dr. H. M. Evans will inject rats with pure growth hormone, a product of the growth-controlling pituitary gland, which regulates hormonal balance within the body. A tracer study of cortisone, a hormonal product of the adrenal glands, will be made by Dr. E. A. Doisy through a grant to the St. Louis University School of Medicine. Dr. R. C. Grauer at the William H. Singer Memorial Research Laboratory in Pittsburgh will investigate the effect of various mixtures of hormones on tissue growth. The possibility that a virus-like agent in the mothers' milk is responsible for the high incidence of breast tumors in rats known as the Albany strain will be investigated by Drs. A. W. Wright and J. M. Wolfe at Albany Medical College, in Albany, New York.

Hypoparathyroidism: A Case Report*

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THYROID surgery ranks first in the causes of hypoparathyroidism.[1] Since thyroid surgery is so commonplace, this case is presented to call attention to some of the possible postoperative complications and the details of their treatment.

It seems strange that we do not see more parathyroid insufficiency after thyroid surgery. It is well known that the parathyroid glands are often aberrant in location. It is often difficult for surgeons experienced in parathyroid surgery to identify this tissue grossly. Black and Haynes[2] recently reported a number of cases where parathyroid tissue was truly intrathyroid in location, especially notable because no connective tissue capsule was present. Considering the foregoing, it is no surprise that even the most careful and experienced thyroid surgeons encounter acute postoperative hypoparathyroidism.

Lack of parathyroid hormone produces the following effects: (1) phosphorus excretion in the urine decreases, (2) serum phosphorus rises, (3) serum calcium falls, and (4) calcium excretion in the urine decreases.[3] The primary effect of parathyroid hormone is thought to be a phosphate diuresis which lowers the serum phosphorus;[4] the inverse fluctuations of the serum calcium level seem due to an attempt by the body to keep the solubility product of some calcium and phosphorus salt constant.[5]

In the postoperative thyroid patient, the appearance of trouble is marked by increased neuromuscular excitability due to hypocalcemia. Since it is imperative that tetany be detected early, a list of the symptoms follows: (1) numbness of the extremities, (2) cramps of the extremities, (3) carpopedal spasm, (4) laryngeal stridor, and (5) generalized convulsions.[6] Especially to be watched for is laryngeal spasm, which may terminate fatally.

Two important physical signs in detection of latent tetany deserve description. So often we speak of classical signs without knowing exactly what they are, how they are elicited, or what they mean. Chvostek's sign is frequently so abused. This sign is elicited by tapping over the facial nerve in front of the ear. What many of us do not know is that some normal adults will respond with contraction of the alae nasi and of the corner of the mouth. When the muscles of the eyelids contract in addition, untreated hypoparathyroidism is almost always present.[7] Trousseau's sign is the assumption of the carpopedal spasm position of the hand when the circulation is restricted. One method of doing it is to keep a blood pressure cuff inflated above the systolic pressure, allowing three minutes before calling it negative.[8] No diagnostic significance should be attached to the absence of this sign.

Chemically, we find in hypoparathyroidism a low serum calcium, a high serum phosphorus, a normal or low serum alkaline phosphatase, and usually no urinary calcium.[9] A simple test to show the amount of urinary calcium is the use of Sulkowitch reagent, which precipitates the calcium as calcium oxalate. This is a useful guide to therapy, and also identifies tetany due to alkalosis, when normal amounts of urinary calcium are present.[10] As a rule calcium is absent from the urine when the serum calcium is below 7 to 8 mg. per cent.[11]

The treatment of acute hypoparathyroidism consists in furnishing the body with two essentials: (1) an adequate amount of utilizable calcium and (2) parathyroid hormone or a substance resembling it in action. In marked hypoparathyroidism, *utilizable*, and I stress this word, calcium can be supplied in amounts needed in only one form, and that is a saturated solution of calcium lactate taken orally. This solution is made by dissolving calcium lactate powder in *boiling* water. Roughly 50 grams of powder (about 12 teaspoonfuls) can be dissolved in a quart of water in this manner. It is usually necessary to begin with from 30 to 40 grams of lactate powder in twenty-four hours.[12] Four ounces of solution can be given every four hours, each dose containing about six grams of calcium lactate. Urine specimens are tested with the Sulkowitch reagent and the calcium intake adjusted accordingly. As an emergency measure it may sometimes be necessary to give intravenous calcium gluconate, but the relief from symptoms thus afforded is short-lived. If necessary a stomach tube can be used to maintain an adequate oral intake, and an indwelling catheter to obtain frequent urine specimens for testing. The parathyroid extract is given intramuscularly; usually 100 units every six to eight hours suffices, but more can be given if judgment so dictates. This is kept up for 48 to 72 hours.[13]

There are two substances which resemble parathyroid hormone in action—vitamin D and dihydrotachysterol (A.T.10). Both will increase calcium absorption from the gastro-intestinal tract and increase phosphate excretion into the urine. Dihydrotachysterol is greater in the latter effect, more closely resembling the hormone,[14] and should be the drug of choice. To start, 1 cc. of the liquid every twelve hours usually suffices.* After three or four days if response is satisfactory, this can gradually be reduced to the maintenance dose. Daily determinations of serum calcium and phosphorus for a time are very helpful.

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*Read at the regional meeting of The American College of Physicians, Grand Forks, North Dakota, September 10, 1949.

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*Hytakerol (Winthrop-Stearns) is available as an oily solution, each cc. containing 1.25 mg. of dihydrotachysterol, or as a capseal containing one-half a cc. of the liquid (0.625 mg.).

There are a few other helpful measures. A high calcium, low phosphorus intake is given, which means that milk is contra-indicated due to its high phosphorus content. Thyroid extract is given to the point of tolerance, since it tends to raise the serum calcium level in hypoparathyroidism.[15] If the patient objects to the taste of the calcium lactate solution, concentrated citric flavoring can be used.

Case Report: This 36 year old housewife was seen on July 20, 1948. Symptoms of hyperthyroidism had been present for three months. Her weight had fallen from 135 to 127 pounds. She had no eye complaints. Examination revealed a well-nourished woman with the classical signs of hyperthyroidism. There was slight exophthalmus. The thyroid was diffusely enlarged, both lobes being about 6x4 cm. in size. A bruit was present over the gland. Her resting pulse rate was 120 per minute.

The basal metabolic rate was plus 60 per cent, and the serum cholesterol 64 mg. per cent. Slight generalized cardiac enlargement was present on the chest x-ray.

The administration of Lugol's solution and 400 mg. of propyl thiouracil daily was begun. In December, 1948, her weight was 142 pounds, B.M.R. plus 8 per cent, and she was asymptomatic. The exophthalmus had improved. One week before surgery propyl thiouracil was discontinued.

Surgery was done December 21, 1948. The gland was very vascular and more than the usual bleeding was encountered from the other tissues as well. The next morning a positive Chvostek's sign was noted. That afternoon she began to complain of pressure in the throat and numbness of the extremities. Carpopedal spasm was present. Intravenous calcium gluconate and intramuscular parathyroid extract, 100 units every six hours was begun. By evening she complained so bitterly of her neck that the decision to reopen the wound was made, since we felt that pressure from hemorrhage might contribute to the parathyroid insufficiency. After a small amount of intravenous pentothal the wound was explored, and only a small amount of blood found. As the wound was closed laryngeal spasm occurred, necessitating emergency tracheotomy. She received morphine for restlessness, and early in the morning of December 23 respirations became very depressed. By morning she was slightly improved and treatment with oral calcium lactate solution was begun (Fig. 1). In addition, she received 10 drops of Lugol's solution and one-fourth grain of thyroid extract daily. Synkamin was given for several days because a postoperative prothrombin time was 40 per cent. She did well and on December 26 the tracheotomy tube was removed.

On December 28 she alternated between periods of hypomania and depression. Over the next few days she manifested periods of extreme depression, with delusions and hallucinations. She was seen by the psychiatrist, and electro-shock treatments begun January 14, 1949. She received four treatments with marked improvement in her mental status and was discharged from the hospital on January 28, 1949.

Subsequent course has been largely uneventful. The treatment program has continued, based on Sulkowitch tests on the urine. The thyroid extract has been increased until now she takes 2 grains daily. She continues on a maintenance dose of 5 drops of Lugol's solution daily and a low phosphorus diet.

Discussion

In retrospect it seems that if intensive treatment for the hypocalcemia had been started earlier many of our difficulties might have been avoided. Hypocalcemia may develop rapidly, and when present, laryngeal symptoms may be confused with pressure due to postoperative bleeding. Morphine should not be used in postoperative thyroid patients, since a routine order such as one-fourth grain every four hours as needed for restlessness could

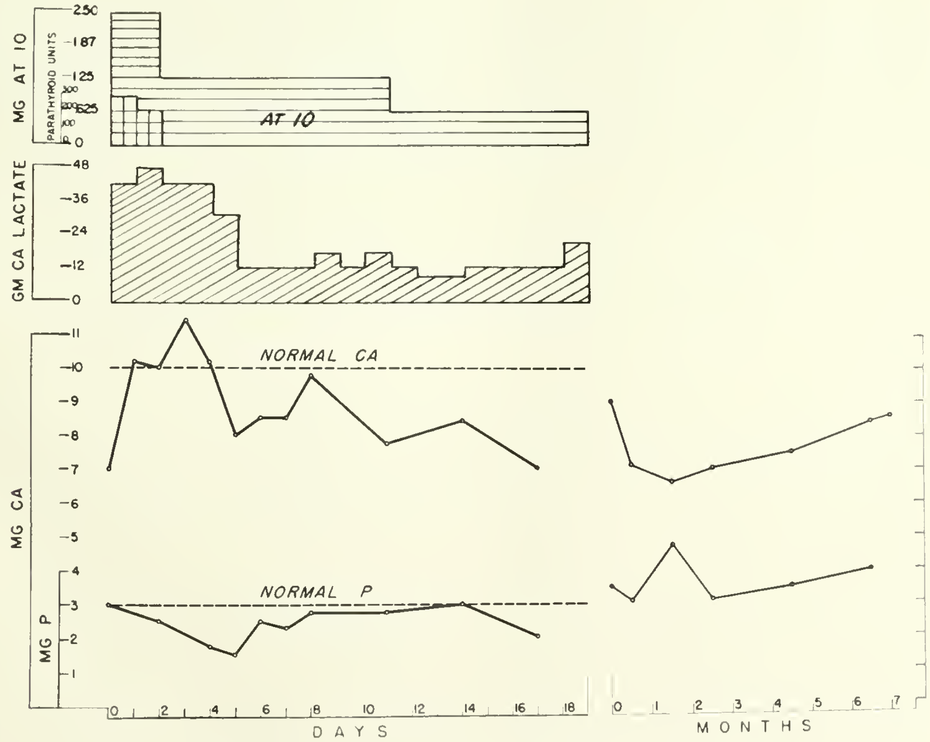

Fig. 1. Postoperative treatment and response over a 7 months period.

easily result in extreme respiratory depression should hypocalcemia develop.

SUMMARY

A case has been presented which includes acute hypoparathyroidism, laryngeal spasm, and later a reactive depression as postoperative complications of subtotal thyroidectomy.

A program of treatment and long term management is outlined.

Addendum:

Sulkowitch solution has the following composition.[10]

Oxalic acid	2.5 gm.
Ammonium oxalate	2.5 gm.
Glacial acetic acid	5.0 cc.
Distilled water q. s. ad.	150.0 cc.

2 cc. of solution are added to 5 cc. of urine. The resulting precipitate is graded on a basis of 0 to 4.

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Care of the Pregnant Diabetic*

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The problem of diabetes complicating obstetrics has been radically altered since the advent of insulin therapy. Formerly, the outlook for both fetus and mother was most discouraging. The majority of women failed to conceive; abortion and premature delivery were twice as frequent as they are today; and maternal fatalities were comparatively high. With insulin therapy and more recently with the use of sulfonamides and antibiotics, better control of diabetes has been possible. Conception rates today of controlled diabetic women are essentially the same as that of non-diabetics. Nevertheless, there persists a relatively high (25 to 35 per cent) fetal neonatal mortality and a somewhat higher than normal abortion incidence. Attempt is being made to reduce these complications.

It has been established by a combined study of diabetes at Cornell, Yale and Harvard, that the same high fetal mortality figure exists in the mild diabetic as in the severe diabetic. Surprisingly, the same figure also exists in the five-year period prior to the onset of diabetes. Hence the discouraging outlook along lines of further improvement with diet and insulin. Definite progress, however, can be made in prevention and treatment of complications in the pregnant diabetic; they are: toxemia, infection, breech and other abnormal presentations, and placenta previa. For the fetal death date is nearly again doubled by such additive factors. Another method to improve the fetal survival rate is through the use of substitutional hormonal therapy. Lastly, there is a trend today toward liberalization of cesarean section prior to term to prevent late intrauterine fetal death.

The handling of the diabetic pregnant patient, as I see it, is resolved into three categories: (1) medical management, (2) the controversial hormonal management, and (3) obstetric management.

Medical Management

During the first two trimesters the treatment differs in no way from that of the usual diabetic patient. The diet is calculated to give adequate protein (2 Gm./Kilo.), and minerals; about 200 Gm. in carbohydrate; and fats to make up a diet of 2,000 to 2,400 calories daily. Enough insulin must be given to keep the patient practically sugar-free around the clock. Since the insulin requirement may increase as pregnancy advances, this requires close checking on the part of the patient. She should be instructed to test her antecibal and bedtime specimens at least several times a week. To prevent excess weight gain it is sometimes necessary to reduce the diet to 1800 calories per day.

In preparation for cesarean delivery the patient should be admitted to the hospital 48 hours in advance. Up to the time of delivery she is given the usual diet. She is taken off protamine zinc insulin and placed on divided doses of crystalline insulin, given before meals and at bedtime. The dosage is determined by urine specimens taken at such times. Four hours before the expected delivery time the patient is given a 400 calorie liquid feeding. This is covered by 1/6 of the total amount of insulin given the previous day. In surgery, 500 cc. of 5 per cent dextrose in saline is started intravenously. The second 1/6 of the daily insulin requirement is mixed directly in the bottle of fluid. As a precautionary measure, a blood sugar level is taken immediately following delivery. Usually no insulin is required at this time. The blood sugar is repeated four hours later, and as a rule another 1/6 of the total insulin amount can be given again. Thereafter, the urinalysis will determine the insulin dosage. Usually it is necessary to give approximately 1/6 of the insulin requirement every four hours for the first 24 hours. The total amount of insulin should not exceed that given on the day preceding surgery.

It is difficult to formulate rules for the care of the patient in the first 24 hours postpartum. The course of the individual patient may vary tremendously. The factors of importance to consider are: (1) tolerance of surgery, (2) ability to take oral fluids and food, and (3) changes in insulin tolerance. It is imperative that the patient be followed very closely during this period, making sure that fluid intake is adequate. If there is any question of status, a blood sugar level should be obtained. By the second postoperative day it is expected the patient will be back on her regular diet, and can be gradually transferred to protamine zinc insulin.

Hormonal Management

The basic underlying maternal abnormalities, in diabetic women, are, according to Priscilla White, an aging vascular system and hypo-ovarianism. This latter condition becomes manifest as a sex hormone imbalance in pregnancy, with lowered levels of estrogen and progesterone and compensatory high chorionic gonadotropic hormone levels. Joslin, White, and Smith and Smith have corrected this imbalance and obtain as high as 90 per cent fetal survival, with a corresponding reduction in incidence of toxemias and premature infants. Their work is authenticated with blood and urine hormone analyses. They find one-third of diabetic women have a normal hormone balance and have a corresponding good fetal outlook. The majority, however, suffer from an endocrine imbalance. Such is correctable, the aim being to suppress high serum levels of chorionic gonadotropic hormone through administration of estrogen and progesterone. An outline of treatment is as follows:

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*Read at the meeting of the Four County Medical Society, Rice Lake, Wisconsin, November 9, 1948.

Up to the 20th week—
stilbestrol, 5 mg.; and progesterone,* 5 mg. daily
20th to 24th week—
stilbestrol, 10 mg.; and progesterone, 10 mg. daily
24th to 28th week—
stilbestrol, 15 mg.; and progesterone, 15 mg. daily
28th to 32nd week—
stilbestrol, 20 mg.; and progesterone, 20 mg. daily
32nd to 36th week—
stilbestrol, 25 mg.; and progesterone, 25 mg. daily
36th week to term—
stilbestrol, 30 mg.; and progesterone, 30 mg. daily

Unfortunately, the cost of such medication is at the present time almost prohibitive. On the assumption treatment is started say at the fourth month, the expense for these drugs alone will be about $500. Criticism has also been directed against the rosy reports of the Boston group in that other investigators have not been able to duplicate their results.

Obstetric Management

The need for good prenatal care is self-evident. Pelvic measurements must be thoroughly and carefully done, bearing in mind the possible vaginal delivery of an excessive size infant with large head and larger shoulders. Emphasis should be given to weight control aiming roughly at one-half pound a week. This is particularly important because of the frequent association of toxemia. We customarily limit salt in diet of all pregnant diabetic women to prevent excess weight gain and edema. When present, ammonium chloride may be additionally prescribed in 6 to 10 Gm. amounts per day to augment fluid loss. Other signs of toxemia, such as urine albumin, elevated blood pressure, and related symptoms, must be recognized early. Treatment should be undertaken at once and preferably, even in mild pre-eclampsia, by hospital means.

Since breech presentation occurs in 33 per cent of cases and exists as a complication with big babies, it should always be looked for in the prenatal visits, from the fifth month on. When present and if spontaneous version does not occur, gentle external version is advised at $7\frac{1}{2}$ months. And if need be, it may be repeated to gain the advantage of a vertex presentation.

Timing of delivery is often a difficult problem in judgment. Such authorities as Stander, Bill, Titus, and others take the stand that delivery should be by vaginal means and be of spontaneous initiation. Cesarean operation would be done only on non-diabetic indications such as cephalo-pelvic disproportion, toxemia and hemorrhage. Notwithstanding these eminent opinions, evidence is mounting to suggest that delivery prior to term may increase the fetal survival rate. Randall at the Mayo Clinic favors cesarean section, and so do the Boston group in two-thirds of cases. I personally favor early delivery and recommend cesarean section, from the 35th to 37th week of gestation depending on estimated fetal weight, if induction and vaginal delivery is not feasible.

There is uniformity of opinion as to the disadvantage of gas anesthetics for these patients. Spinal, caudal, or local block anesthesia have been recommended. Because of greater danger of the former, particularly caudal, local block anesthesia with one per cent procaine is favored for either cesarean or vaginal delivery. If properly performed no additional gas is needed.

Infants in poor condition or infants of mothers who are severe diabetics should receive special care postpartum. Immediate care of these newborns consists of incubation, oxygen therapy, glucose and saline by hypodermoclysis and intravenous routes, and occasionally blood transfusion.

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*Proluton (Schering Corp., Bloomfield, N. J.)

GRANTS FOR INFANTILE PARALYSIS RESEARCH

Twenty-nine research and educational projects in infantile paralysis, totaling $849,738.68, have been awarded to scientific and technical institutions throughout the United States and Canada. Among the approved studies are grants of $28,000 to the Children's Hospital in Boston, for improving methods for "in vitro" propagation of poliomyelitis virus in non-nervous tissue; $49,300 to the University of California in San Francisco for development of the flocculation method for virus identification and diagnosis of the disease; $17,200 to New York University—Bellevue Medical Center, for development of a diagnostic complement fixation test; $28,990 to University of Toronto, for studies on prevention of the disease with high titer poliomyelitis antisera.

Incidence of Types of Cardiac Deaths in 50,730 Autopsies*

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The types of cardiac diseases discussed are the 349 congenital hearts found in 30,036 autopsies (1.1 per cent) during the years 1936-47 and the 9585 noncongenital hearts found in 50,730 autopsies (18.8 per cent) not including the still births in the years 1910-47, inclusive. The congenital hearts are analyzed over a shorter period since they have not been studied as carefully as the noncongenital hearts up until recent years. The combined number of 9934 cases comprises approximately 20 per cent of all autopsies. Disease of the heart is the most common cause of death.

Congenital diseases of the heart. Seven embryological processes and developmental anomalies (septal formation, rotation and torsion, adjustment of the aortic arches, valvular deformities, primary changes in the atria or ventricles, pericardial defects and coronary arterial defects) have to be considered in interpreting the vast number of congenital cardiac disturbances which may occur. These altered processes or anomalies may be exhibited singly or in combinations. The kinds and frequency of each are seen in Table I.

TABLE I
Congenital hearts (349 cases) in 30,036 autopsies (1.16 per cent), 1936 to 1947

Type	No.	Pct. of Groups	Pct. of Total Group
I. Disturbances in formation of septa	193		55.30
1. Persistent truncus arteriosus	12	6.21	3.43
2. Atrial septal defect	28	14.50	8.02
3. Ventricular septal defect	86	44.55	24.64
4. Septal defects (special) Vessels in normal position	32	16.58	9.16
a) Lutembacher's disease	6	18.75	
b) Cor biloculare (primary)	14	43.75	
c) Cor triloculare biatriatum	12	37.50	
5. Septal defects with certain other combined defects	35	18.13	10.02
a) Tetrology of Fallot	26	74.28	
b) Eisenmenger's disease	9	25.71	
II. Disturbance in rotation and torsion	21		6.01
1. Transposition of great vessels			
a) with closed ventricular septum	15	71.42	
b) with ventricular septal defects	6	28.57	
III. Disturbance in adjustment of aortic arches	69		19.77
1. Coarctation of aorta	43	62.32	12.32
a) infantile type	30	69.76	
b) adult type	13	30.23	
2. Patent ductus arteriosus	26	37.68	7.45
IV. Valvular deformities	46		13.20
1. Aortic	21	45.65	6.01
2. Mitral	7	15.23	2.00
3. Tricuspid	6	13.04	1.71
4. Pulmonary	12	26.08	3.46
a) without septal defects	9	75.00	
b) with atrial septal defects	1	8.33	
c) with both atrial and ventricular septal defects	2	16.66	
V. Primary changes in atria or ventricles	17		4.87
1. Congenital idiopathic hypertrophy	15		
2. Congenital rhabdomyosarcomatosis	1		
3. Marked dilatation of right ventricle	1		
VI. Pericardial defects	1		0.28
VII. Coronary arterial defects	2		0.57

Rheumatic diseases of the heart. The types of rheumatic heart diseases are acute rheumatic endocarditis, recurrent rheumatic endocarditis, valvular deformities resulting from recurrent attacks of acute rheumatic endocarditis and adherent pericardium which follows acute rheumatic fibrinous pericarditis. Table II shows the types of rheumatic heart diseases in the 50,730 autopsies.

TABLE II
Types of rheumatic heart disease (1595 cases) in 9585 cardiac cases (16.64 per cent) and in 50,730 autopsies (3.14 per cent). 1910-1947

Types	No.	Pct. of Group	Pct. of Cardiac Cases	Pct. of Autopsies
1. Acute rheumatic	133	8.33	1.38	0.26
2. Recurrent rheumatic	130	8.15	1.35	0.25
3. Valvular deformities	1284	80.50	13.39	0.53
a) incompletely healed	175	13.62		
b) completely healed	552	42.99		
c) calcific aortic	557	43.38		
4. Adherent pericardium	48	3.00	0.50	0.09
Total	1595	99.98	16.64	3.14

Bacterial endocarditis. Bacterial endocarditis is characterized anatomically by large soft villous vegetations in contrast to the small firm smooth globular verrucous vegetations of rheumatic endocarditis. The term bacterial endocarditis is used because in most cases bacteria, usually Str. viridans, are easily found in large numbers in blood cultures and in the vegetations.

Cases of bacterial endocarditis with a clinical duration of not more than six weeks are classified as acute bacterial endocarditis and the cases with a duration of more than six weeks as subacute bacterial endocarditis. The acute form may be considered primary acute when not immediately associated with any other infection and secondary acute when overshadowed by a major primary infection, such as puerperal infection and pneumonia, or when associated terminally with some wasting disease.

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*From the Department of Pathology, University of Minnesota.

such as carcinoma. Subacute bacterial endocarditis runs a slower course. The term was first used by Libman.[1] It was called endocarditis lenta by Schottmüller.[2] Ulcerative endocarditis has been used to describe the disease.

The types and incidence of each type are observed in table III.

TABLE III

Types of bacterial endocarditis (786 cases) in 9585 cardiac cases (8.20 per cent) and in 50,730 autopsies (1.54 per cent) 1910-1947

Types	No.	Pct. of Group	Pct. of Cardiac Cases	Pct. of Autopsies
1. Primary acute	63	8.01	0.65	0.12
2. Secondary acute	183	23.28	1.90	0.36
3. Subacute	540	68.70	5.63	1.06
Total	786	99.99	8.20	1.54

Syphilitic heart disease. Cardiac failure resulting from the effects of syphilitic aortitis, syphilitic valvulitis or much less frequently from syphilitic myocarditis or gumma of the myocardium is the most common cause of death in acquired syphilis. The term syphilitic heart disease includes cardiac deaths immediately associated with syphilitic aortitis. In only one case, a gumma of the myocardium, in a series of 422 syphilitic cardiac deaths is there an absence of a syphilitic aortitis.

There has been a marked and significant drop in the incidence of syphilitic heart disease in Minnesota and probably in other parts of the country in the last 19 years. This is illustrated in table IV.

TABLE IV

Incidence of cardiac syphilis per thousand autopsies per five year period—1914-1947

Periods	Number of Cardiac Cases	Number of Autopsies	Per Thousand Autopsies
1914-1918	21	1,588	13.2
1919-1923	36	2,700	13.3
1924-1928	73	5,535	13.2
1929-1933	98	9,609	10.2
1934-1938	88	11,298	7.8
1939-1943	77	11,575	6.4
1944-1947*	19	8,892	2.1

*The last period has only four years.

The cause of this highly significant reduction in syphilitic heart diseases can only be speculative.

Depending upon the manner in which death occurs primarily, syphilitic heart diseases in the 422 cases are divided into four types: aortic insufficiency, narrowing of the coronary orifices, rupture of an aortic aneurysm and gumma of the myocardium. The incidence of each type is noted in table V.

TABLE V

Types of syphilitic heart disease (422 cases) in 9585 cardiac cases (4.40 per cent) and in 50,730 autopsies (0.83 per cent) 1910-1947

Types	No	Pct. of Group	Pct of Cardiac Cases	Pct. of Autopsies
1. Aortic insufficiency	247	58.53	2.57	0.48
2 Narrowing of coronary orifices	80	18.95	0.83	0.15
3 Rupture of aortic aneurysm	89	21.09	0.93	0.17
4 Gumma of myocardium	6	1.42	0.06	0.01
Total	422	99.99	4.40	0.83

The hypertensive cardiac diseases. This large group includes the cases of heart failure in which death is brought about by the effects of high blood pressure primarily on the heart. Depending upon the manner in which death finally occurs the group of hypertensive heart diseases may be divided into four divisions: myocardial insufficiency, coronary sclerosis with hypertension, encephalic (apoplectic) and renal insufficiency. There is a high degree of overlapping of the first in the last three divisions but in most of them death would sooner or later have resulted from myocardial insufficiency. In table VI the incidence of the types of the hypertensive heart diseases may be observed.

TABLE VI

Types of hypertensive heart disease (5935 cases) in 9585 cardiac cases (61.91 per cent) and in 50,730 autopsies (11.69 per cent). 1910-1947

Types	No.	Pct. of Group	Pct. of Cardiac Cases	Pct. of Autopsies
1. Myocardial insufficiency	2221	37.42	23.17	4.37
2. Coronary sclerosis	2507	42.24	26.15	4.93
3. Encephalic (apoplectic)	847	14.27	8.83	1.66
4 Renal	360	6.06	3.75	0.71
Total	5935	99.99	61.91	11.69

Coronary sclerosis. Coronary sclerosis with or without coronary thrombosis and myocardial infarction is the most common cause of angina. One clinical type of coronary disease occurs with hypertension and generally shows, therefore, the symptoms and signs of hypertension in addition to those of coronary disease. In another less common clinical type there is no hypertension or cardiac hypertrophy. The incidence of the types of coronary disease including those with and without hypertension is seen in table VII.

TABLE VII

Types of coronary sclerosis (3084 cases) in 9585 cardiac cases (32.17 per cent) in 50,730 autopsies (6.07 per cent). 1910-1947

Types	No.	Pct. of Group	Pct. of Cardiac Cases	Pct. of Autopsies
1. With hypertension	2507*	81.29	26.15	4.93
a) B.P. 150 or more	877			
b) B.P. unknown or below 150, Ht. Wt. M. above 400, F above 350	1630			
2. Without hypertension	577	18.71	6.01	1.13
Total	3084	100.00	32.17	6.07

*2507 included in the hypertensive group.

Chronic cor pulmonale. Cor pulmonale is a type of right heart failure independent of left heart failure due to an increase of blood pressure in the pulmonary artery. Cyanosis is a prominent sign. The condition may be of short duration (acute cor pulmonale) or the symptoms may be long standing (chronic cor pulmonale). Only the latter group is considered in this report. The incidence with the causes of the cases of chronic cor pulmonale in males and females in our series is observed in table VIII.

TABLE VIII

Primary right heart failure—cor pulmonale (216 cases) in 9585 cardiac cases (2.25 per cent) and 50,730 autopsies (0.42 per cent). 1910-1947

Causes	M	Pct.	F	Pct.	Total	Pct.
1. Pulmonary tuberculosis	41	27.16	27	41.53	68	31.48
2. Bronchial asthma	40	26.49	8	12.20	48	22.22
3. Bronchiectasis	26	17.21	7	10.76	33	15.26
4. Emphysema	15	9.93	4	6.15	19	8.79
5. Silicosis	11	7.28	5	0.00	11	5.09
6. Deformity of chest	6	3.97	5	7.84	11	5.09
7. Fibrosis of lung	2	1.32	7	10.76	9	4.16
8. Pulmonary embolism or thrombosis	6	3.97	3	4.61	9	4.16
9. Pulmonary arteriosclerosis	2	1.32	4	6.15	6	2.77
10. Pressure of syphilitic aorta upon pulmonary artery	1	0.66	0	0.00	1	0.46
11. Unknown	1	0.66	0	0.00	1	0.45
	151	99.97	65	100.00	216	99.94

Miscellaneous cardiac diseases. A small group of diseases of the heart is listed as miscellaneous. They are recognized and observed by cardiologists. We have not had some of them in our autopsy material such as the beriberi heart. Clinical cardiac failure is observed with chronic glomerulonephritis but in our cases death was apparently due to uremia in all cases. Cardiac hypertrophy and dilation without hypertension is a fairly common but doubtful group which deserves further study before it is separated entirely from the group of hypertensive hearts. The incidence of this miscellaneous group is given in table IX.

TABLE IX

Miscellaneous cardiac diseases (11 cases) in 9585 cardiac cases and in 50,730 autopsies. 1910-1947

Types
1. Thyroid (10)
a) Hyperthyroid (9)
b) Hypothyroid (1)
2. Primary renal disease
a) Glomerulonephritis (0)
3. Beriberi Heart (0)
4. Arteriovenous aneurysm (1)
5. Cardiac hypertrophy and dilation without hypertension (263*)?

*263 included with the hypertensive hearts

Primary diseases of the myocardium (toxic myocardium—isolated myocarditis—Fiedler's myocarditis). The frequency of these types of myocardial injury and failure is seen in table X.

TABLE X

Diseases of the myocardium (43 cases) in 9585 cardiac cases (0.44 per cent) and in 50,730 autopsies (0.08 per cent). 1910-1947

Types	No.	Pct. of Group	Pct. of Cardiac Cases	Pct. of Autopsies
1. Toxic myocardium	17	39.53	0.17	0.03
2. Isolated myocarditis	26	60.46	0.27	0.05
Total	43	99.99	0.44	0.08

A few cases of cardiac disease due to degenerative processes as amyloid or hemochromatosis of the myocardium and the cases of tumors of the heart have not been included in this analysis. Most of the diseases of the pericardium except tuberculous pericarditis have been included in the groups of rheumatic and bacterial endocarditis.

Summary

A short description with the incidence of the 349 cases of congenital heart diseases in 30,036 autopsies and of the 9585 cases of noncongenital cardiac deaths in 50,730 autopsies is given.

The congenital hearts comprise 1.1 per cent of the autopsies and the group of noncongenital heart diseases 18.8 per cent. The total group of 9934 cases includes 19.9 per cent of the autopsies. Disease of the heart is the most common cause of death in the autopsy series in the Department of Pathology at the University of Minnesota.

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NATIONAL GASTROENTEROLOGICAL ASSOCIATION
1950 AWARD CONTEST

The National Gastroenterological Association again takes pleasure in announcing its Annual Cash Prize Award Contest for 1950. One hundred dollars and a certificate of merit will be given for the best unpublished contribution on gastroenterology or allied subjects. Certificates will also be awarded those physicians whose contributions are deemed worthy.

Certificates awarded to other physicians will be mailed to them. The decision of the judges will be final. The Association reserves the exclusive right of publishing the winning contribution, and those receiving certificates of merit, in its official publication, *The Review of Gastroenterology.*

All entries for the 1950 prize should be limited to 5,000 words, be typewritten in English, prepared in manuscript form, submitted in five copies accompanied by an entry letter, and must be received not later than June 1, 1950. Entries should be addressed to the National Gastroenterological Association, 1819 Broadway, New York 23, N. Y.

The Treatment of Pemphigus Vulgaris*

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The treatment of pemphigus is an empiric one, carried out in the past with various chemicals whose actions were expected to have a specific effect. The results with arsenic therapy have been gratifying at times, but most of the patients succumb to the disease early. In recent years, germanin has been used with results which have been no better than those with arsenic.

The shortcomings of empiric pemphigus therapy prompted us to study the pemphigus patient from a metabolic viewpoint. Because the patients were losing much fluid as serum, we wished to ascertain how such a loss affected the patient's physiology. We verified the findings of others that there was a lowering of the total serum proteins and a marked disturbance in nitrogen metabolism. Both of these disturbances are at least partially due to loss through the denuded areas or into the many bullae in pemphigus. Blood chemical studies in pemphigus indicate a lowering of total serum proteins. The changes in acid base balance may also be a reflection of the fluid loss.

Observation of pemphigus patients has revealed the development of a profound anemia when the disease progresses unfavorably, accompanied by a decided disturbance of nutrition with a marked weight loss, and an elevated temperature. Efforts were made to reduce the temperature with many of the new available agents such as sulfonamides, penicillin, streptomycin, and aureomycin, but none of these drugs produced a lasting effect. Transfusions were used to combat the effects of the anemia, and also replenish fluids and proteins which the patient needed so badly.

It is well known that pemphigus may be present and may even progress for a long time before there is any constitutional derangement. Patients are frequently seen with a very severe cutaneous change whose general condition remains good, an observation which emphasizes the fact that the prognosis in pemphigus is good as long as the patient is able to resist systemic involvement. However, when constitutional symptoms have gained the upper hand drastic measures are usually necessary to bring about improvement. The more readily this improvement occurs, the better are the prospects for a temporary recovery. It, therefore, becomes important to keep the patient's general nutrition at a high level to ward off the possibility of collapse.

Patients who recover must elaborate some type of immune substance or resistive mechanism which makes it possible for them to handle the disease better. The fact that a few patients have reportedly recovered following the transfusion of blood from patients convalescing from pemphigus strongly points to such an immunity. Our efforts are, therefore, directed toward maintaining a good body economy in the pemphigus patient.

Sturdy convalescent pemphigus patients are rare and hard to find. For that reason, only a small amount of blood from such convalescent patients would be available for use in transfusions to others with active florid pemphigus. An approach with convalescent serum in divided doses was attempted in the hope that this step might be more effective than a single transfusion.

It was possible to obtain 500 cc. of blood from each of two patients who had apparently recovered from pemphigus. The serum was separated aseptically and placed in divided quantities into smaller vials for use in multiple injections. The 1000 cc. of blood yielded about 540 cc. of serum and was given in divided doses to six patients.

The initial dose of 40 cc. was administered intramuscularly to each patient and repeated in three days. The next doses varied from 5 to 40 cc., depending on the amounts of serum available plus the patient's apparent response, and were given at intervals of three days. The total dose varied from 80 to 130 cc. in the patients treated.

There was no untoward response in any of the six patients. In four of them, the temperature came down partially. Two of the patients cleared almost completely and have had an occasional bulla. Two have died and the other two still have severe cutaneous involvement. The response in the two patients who have improved is only suggestive evidence but sufficient to make one wonder whether the treatment would have been more effective if more convalescent serum was available to each patient.

In certain metabolic diseases, testosterone has been shown to have a beneficial effect upon the utilization of nitrogen. An effective metabolism of protein was demonstrated in some of the catabolic diseases such as Simmonds disease and hyperthyroidism. The anabolic effects are exerted through the anterior lobe of the pituitary or the adrenal cortex. Testosterone propionate and chorionic gonadotropin induce retention of nitrogen, inorganic phosphorus, sulfates and potassium in large amounts. Kenyon et al demonstrated the fact that testosterone propionate injected intramuscularly produced reduction in the urinary excretion of nitrogen, sodium, potassium, and chlorides together with a gain in weight. A reduction in the excretion of inorganic phosphorus also occurred. Most important, the testosterone has been shown to produce a positive nitrogen balance. Lewis and McCullogh have demonstrated that, following the administration of testosterones, a marked increase occurred in the plasma protein level, especially that of the gamma globulin fraction.

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*Read as an Inaugural Thesis before the Minneapolis Academy of Medicine, October 17, 1949

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The use of testosterone in the supportive treatment of the pemphigus patient appeared to be indicated for two reasons. First, in pemphigus a disturbance in acid base balance and ions is attributed to adrenal gland damage. Secondly, there is a great deal of protein loss through the bullae and denuded areas of pemphigus. The effect of testosterone might be expected to correct both these alterations.

Before the use of testosterone to affect nitrogen metabolism, our efforts were directed at supplying pemphigus patients with large amounts of protein in easily utilized form. A higher protein intake was accomplished by the use of protein hydrolysate parenterally and such special protein foods as dietene, protenum, and casec orally. The effect on protein metabolism was measured by changes in body weight, nitrogen excretion, and changes in serum protein levels. Proteins were also supplied in the form of plasma proteins in whole blood plasma transfusions.

On the basis of the above suggestive evidence, testosterone propionate was used in several of our patients with encouraging results. The patients showed subjective improvement, have seemed stronger, and gained weight.

In addition to administration of testosterone, much of the fluid loss was replaced by means of a high oral intake, and the use of intravenous fluids, consisting of dextrose in distilled water or saline, protein hydrolysate in saline and blood transfusions. Prevention of too much fluid loss in those patients with many bullae was attempted, by treating the patient as one with extensive burns and using pressure dressing over the bullae and the denuded areas.

In the foregoing section are listed all the therapeutic devices utilized in the handling of sixteen pemphigus patients seen at the University of Minnesota Hospitals. Of the sixteen, only six were given convalescent serum and six received testosterone. In the group that received testosterone, two were elderly females who received no apparent benefit, followed a downhill course, and expired early. The four males fared better and their case histories, including labobratory studies, are listed below to demonstrate the results of steroid therapy.

Case 1. F. N., male, age 80, born in Finland, was admitted to the dermatologic service of Dr. H. E. Michelson on September 20, 1948. The eruption had begun three months before admission, and on admission a diagnosis of pemphigus vulgaris was made. Laboratory studies showed a hemoglobin of 13.7 grams, and WBC of 8,900. The serum albumin was 2.89 grams and the globulin 3.66 grams for a total of 6.55 grams. The plasma protein levels as shown in Table I demonstrate a reversal of the normal A/G ratio.

TABLE I

	Sept. 1	Oct. 13	Nov. 1	Nov. 9	Nov. 22
Albumin	2.89	2.6	3.1	2.67	3.1
Globulin	3.66	4.2	4.2	5.63	3.8
Alpha	1.13			1.29	
Beta	0.89			1.06	
Gamma	1.64			3.28	

The patient was given 300,000 units of penicillin daily from September 18 through the 27th. On September 27, streptomycin in doses of 15 grams every six hours for ten days was given. Acetarsone in doses of .75 grams daily was administered for a time. The patient also received a total of 2,000 cc. of citrated blood in four transfusions given from September 27 through October 25.

On October 7, a high caloric diet was begun at the same time that intravenous administration of amigen (protein hydrolysate) was instituted. On October 12, testosterone propionate in doses of 25 mgm. three times per week was begun. A higher protein oral intake ranging from 100 to 200 grams daily was ordered.

The patient's weight as well as his urinary output of nitrogen was checked. He weighed 141 pounds on admission and dropped to 124 pounds. Shortly before discharge from the hospital, his weight had returned to 1.32 pounds and the albumin globulin ratio was about 1 to 1. On October 24, the amigen was discontinued and the patient took protenum in quantities up to 1,000 cc. daily: About 200 cc. of protenum contains 28 grams of protein.

A general program of support with an effort at physical stimulation plus exercise was also instituted. The patient was led in hyperventilation exercises plus systematic movements of the extremities.

The excretion of nitrogen is some index of the patient's general condition. A normal individual will excrete the nitrogen in the same quantity that he ingests it. The patient under study was taking in many times more nitrogen per day than he was excreting, indicating that he was losing the nitrogen through the skin or was replenishing a previous loss. With the use of testosterone, we hoped to bring about the proper utilization of nitrogen.

Case 2. G. L., white male, age 72, of Swedish birth, was admitted on October 23, 1948. A diagnosis of pemphigus vulgaris was made.

Laboratory studies at the time of admission revealed a hemoglobin of 12.5 grams; WBC of 6,750 with 9 per cent eosinophils; and the sedimentation rate was 80 mm. in 60 minutes. The BUN was 15 mgm. per cent and the blood chlorides 608. The serum albumin was 3.9 grams and the globulin 3.8 grams.

On October 23, the first dose of 25 mgm. of testosterone propionate was given. On November 14, the BUN was 32 and on the fifteenth, 52 mgm. Two days later, it had risen to 63 mgm. and the testosterone was discontinued. Clinical improvement in the patient had occurred by this time. On December 21, just before discharge, the BUN was 46 mgm. per cent and the patient continued to develop new bullae as the old ones cleared up. The serum albumin was 4.0 and the globulin 4.1 at the time of discharge. The patient's general condition remained good.

Case 3. O. M., white male, Norwegian descent, age 64, was admitted on January 11, 1949, with a diagnosis of pemphigus vulgaris. He also had benign prostate hypertrophy. The contemplated urologic surgery was deferred until the pemphigus could be controlled.

Laboratory examination revealed a hemoglobin value of 13.2 grams with a WBC of 7,900. The serum albumin was 2.5 and globulin 2.9. The globulin fractions were reported as alpha 1.1, beta 0.8, and gamma 1.0.

The patient had been receiving 100,000 units of penicillin every six hours from the day of admission until January 27, 1949. It was discontinued at that time and the patient was given 75 mgm. of testosterone propionate intramuscularly daily until February 4, 1949. He was also getting a high protein diet which included about 1,000 cc. of protenum daily. On February 11, 1949, methyl testosterone in doses of 25 mgm. three times daily was substituted for testosterone propionate, and continued until the discharge date. The patient's general condition improved and the number of bullae decreased markedly. The patient withstood the prostatic surgery well. During the period of treatment with the androgen, the serum proteins increased, with most of the increase in the gamma globulin fraction.

The examination of the serum at the time of discharge showed the albumin to be 2.5 grams and the globulin 4.2

grams. The alpha globulin was 1.3, beta 1.0, and gamma 1.9. There was an improvement in the total proteins, but the ratio was still reversed.

Case 4. M. J., 70-year-old American farm laborer, was admitted on June 14, 1949, with a diagnosis of pemphigus vulgaris. He appeared to be somewhat disoriented.

Laboratory examination revealed a hemoglobin of 11.4 grams with a white blood count of 12,300. The differential count included an eosinophilia of 10 per cent. The sedimentation rate was 104 mm. and fractional proteins were reported as albumin 3.2 and globulin 3.5.

During the first week many new bullae developed and the patient seemed to be more disoriented. A course of therapy which included ascorbic acid 11 mgm., Rutin 3,000 mgm., and testosterone propionate 25 mgm. per day was instituted. The patient developed fewer bullae, became more lucid and his general condition improved, with a gain of 16 pounds during his hospital stay.

The BUN remained within normal limits. The fractional proteins at the time of discharge were reported albumin 1.4 and globulin 4.7.

TABLE II

	June 15	June 23	July 14	July 18
Albumin	3.2	2.0	2.3	1.4
Globulin	3.5	4.9	5.9	4.7
Alpha			1.6	1.3
Beta			0.8	1.1
Gamma			3.5	2.3

SUMMARY

1. Sixteen patients with pemphigus vulgaris were treated with some part or all of the supportive therapy that includes (1) high protein intake, (2) high caloric intake, (3) adequate intake of electrolytes (sodium, potassium, and chlorides), (4) vitamin and crude liver as dietary supplements, (5) testosterone propionate for its supposed effect in aiding restoration of positive nitrogen balance.

2. All of the patients had a trial with acetarsome early in the disease. There were no lasting beneficial results seen.

3. All patients received additional fluids orally and parenterally.

4. The anemia was improved by transfusion.

5. The skin condition itself was treated by various means, most prominent of which was the use of pressure dressings.

6. The protein requirements were supplied by a high protein diet plus feedings of protenum, casec, or dietene. Protein hydrolysate was also supplied parenterally.

7. Of six patients treated with convalescent serum, two are almost completely free of bullae. Two others have improved.

8. Four male patients who were treated according to part of all of the regime plus testosterone propionate survived and improved. Two elderly female patients who were also given methyl testosterone slipped steadily and expired in the hospital. Three of the male patients had some evidence of renal impairment and two were subjected to transurethral prostatic resection during their hospital stays. In spite of these complications, all of them developed a good balance with the pemphigus.

9. Testosterone propionate was an aid in establishing a better utilization of protein and improved the patient's general condition.

10. Testosterone therapy was discontinued in one patient because it raised his blood urea nitrogen.

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Lipoid Nephrosis*

(*A Case of Nephrosis in a White Boy 26 Years of Age*)

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SINCE 1905, when Friedrich Müller first introduced the term nephrosis to indicate a degeneration of the renal tubules, there has been a great disagreement as to its meaning. At the present time nephrosis is an ambiguous term which conveys no clear concept to many and is used by different persons with different connotations.

Volhard and Fahr [2] speak of "genuine nephrosis" and Epstein [3a] of "lipoid nephrosis" indicating a definite symptom-complex the basis of which is a purely degenerative renal tubular lesion without any inflammatory or glomerular changes. Volhard and Fahr [2] regarded nephrosis as a metabolic disorder and not a primary renal disease.

The majority of authors use the terms "pure lipoid nephrosis" and "mixed type of lipoid nephrosis," the latter referring to cases with hypertension or renal insufficiency.

The cause of the disease is not known. It may follow an acute infection,[8,9,10a,10b] but frequently the onset is insidious. Blackman [4a,4b] has produced evidence which suggests that pneumococcus infection may play an important part in the etiology of nephrosis. Gavaerts [5] and Volhard [4a] have offered the explanation that chronic pneumococcal infection may be the cause of the disease. Leiter,[6] on the other hand, in a review of the literature on the subject, concluded that in most cases there was no definite relationship to infectious disease.

The incidence of nephrosis is somewhere between one and five per cent of all patients with bilateral nonsuppurative renal disease.[6,16a]

The prognosis in nephrosis seems to depend on two factors: the incidence of true hematuria and the development of peritonitis, most often pneumococcic.[7] Gross hematuria on one or more occasions or persistent hematuria over longer periods virtually spells death. Some authors feel that from 25 to 50 per cent of patients with nephrosis make a complete recovery.[7,16b]

Characteristic of the disease are some or all of the following features: marked edema, low plasma protein concentration, reversal of albumin-globulin ratio, oliguria, severe albuminuria, high specific gravity of the urine, and absence of hypertension, cardiac hypertrophy, hematuria and renal insufficiency.[3,4a,6,9,10a,10b,13] The disease occurs chiefly in children and is further characterized by frequent exacerbations and remissions.

CASE REPORT

The patient was first seen at Bellevue Hospital on September 27, 1942, at the age of 22 months, because of long-standing edema and a cold that had lasted for three days. The family and past histories were irrelevant, Edema was first observed when the child was seven months of age. At this time, while he was teething, his eyelids became puffy and his mother noted that although his urine looked the same, he voided less than usual. With each new tooth during the next six months his eyes became puffy and he developed a moderate elevation of temperature. At 13 months of age he developed generalized edema and was admitted to the local hospital. While there, his urine was examined for the first time, and showed albumin, red cells and white cells. Mercurials caused a temporary diuresis, but after two and one-half months his condition was essentially the same and he was discharged from the hospital. At home he was given a high-protein, low-salt diet with restricted fluids. His condition remained unchanged, however, until two days before admission to Bellevue Hospital, when he developed fever and gained about four pounds in weight.

Examination. Temperature was 104.5 F., pulse 180, blood pressure 148/100, weight 38.5 pounds. Examination revealed an acutely ill, dyspneic, pale child. Both eyelids were swollen closed; nose and throat were normal; the lungs were clear throughout but there were rapid grunting respirations; a tachycardia was present (the heart was otherwise normal); the abdomen was greatly distended (a fluid wave was present and the percussion note was flat all over the abdomen); there was a marked umbilical hernia, marked edema of the genitalia and marked pitting edema of the lower extremities.

Laboratory Findings. The hemoglobin was 11.5 grams, red cell count was 4.7 million and the white cell count was 22,500 with 75 per cent neutrophiles. Urinalysis revealed a marked albuminuria, 1-2 red cells (high power field) and 3-4 white cells (high power field.) Specific gravity on admission was 1.008. Blood studies revealed a total protein of 3 grams per cent, an albumin of 1.2 grams per cent, a globulin of 1.8 grams per cent, a non-protein nitrogen of 28 milligrams per cent, and a cholesterol of 365 milligrams per cent.

Clinical course and treatment. Sulfadiazine was started on admission. Three liters of cloudy fluid, specific gravity 1.010, were removed by abdominal paracentesis. Type XXIII pneumococcus was cultured from this fluid. As the child's temperature returned to normal in twenty-four hours the sulfadiazine was continued for only four days. Following paracentesis a diuresis developed, the edema disappeared, and by the day of discharge the child weighed only 24 pounds, a loss of 14½ pounds. Throughout his stay in the hospital his urine continued to show a great deal of albumin, a few red cells and white cells and the blood pressure remained elevated. He was discharged on the eighteenth hospital day greatly improved.

Second admission. At home his weight remained stationary for about two months. At the end of this time he developed a cold and slowly began to gain weight. He was readmitted two months after his first admission.

Examination. Temperature was 101° F., pulse 136, blood pressure 135/95, weight 31.5 pounds. Examination revealed an acutely ill child with edema of the entire body. The eyelids were puffy but not as much as upon the previous admission. Both fundi appeared normal. There was a serous discharge from the nose. The oral pharynx was inflamed moderately and had a granular appearance. The tonsils were moderately enlarged and injected. The lungs were clear. The heart appeared normal, and no murmurs were heard. The abdomen was enlarged. There was a slight protrusion of the umbilicus and a fluid wave was present. There was no edema of the genitalia. There was a two plus pitting edema of the lower extremities.

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*Many thanks are due to Dr. Harry Bakwin, New York City, who was the inspiration for gathering the material and presenting this interesting case.

Laboratory findings. The hemoglobin was 11.5 grams, red cell count was 4.2 million, and the white cell count was 23,200 with 58 per cent neutrophiles. Urinalysis revealed a marked albuminuria, 2-3 red cells (high power field), occasional white blood cells and hyaline casts (high power field) and a specific gravity of 1.014. Blood studies revealed a total protein of 4.6 grams per cent, an albumin of 2.3 grams per cent, a globulin of 2.3 grams per cent, a non protein nitrogen of 30 milligrams per cent and a cholesterol of 470 milligrams per cent. A few pneumococci were found in the nose and throat, but were not typed.

Clinical course and treatment. Sulfadiazine was given to the child all the time he was in the hospital but did not seem to affect his temperature or general condition very much. Temperatures of 100 plus occurred daily. Abdominal findings were at no time severe enough to do a paracentesis. Daily urines showed fairly constant findings: 3-4+ albumin, a few white blood cells and a few red blood cells (high power field). Blood pressures ran between 130/90 and 130/95. The child was discharged on the seventh hospital day in spite of his condition, as we thought he would be happier at home. Weight at discharge was 32 pounds, a gain of about one-half pound during his stay in the hospital.

Third admission. The boy's condition remained essentially the same for about three weeks. Then he developed a cold and cough. Two days later his temperature rose to 104 F., he would not eat, became dyspneic, and developed a diarrhea of five to six green loose stools daily. He was readmitted three weeks after his second admission.

Examination. Temperature was 103°, pulse 150, respiration 64, blood pressure 140/90, weight 35 pounds. Examination revealed an acutely ill, dyspneic child. There was no periorbital edema. The fundi were normal. The oral pharynx was moderately inflamed and the tonsils were moderately inflamed and enlarged two plus. There was dullness to percussion over both lung bases posteriorly, fine inspiratory râles were heard over these same areas and there was bronchial breathing beneath the angle of the right scapula. The heart was of normal size, and no murmurs were heard. The abdomen was quite distended, a fluid wave was present and there was shifting dullness in the flanks. The genitalia were edematous and there was a moderate edema of the lower extremities.

Laboratory findings. The hemoglobin was 10 grams, red blood cells present were 2.9 million and white blood cells were 14,000 with 35 per cent neutrophiles. Urinalysis revealed a marked albuminuria, an occasional white blood cell (high power field), (no red blood cells or casts were seen), and a specific gravity of 1.020. Blood studies revealed a CO_2 of 39 volumes per cent, a total protein of 2.9 grams per cent, an albumin of 0.9 grams per cent, a globulin of 2.0 grams, a non-protein nitrogen of 29 milligrams per cent, and a cholesterol of 266 milligrams per cent.

Clinical course and treatment. An immediate abdominal paracentesis was done and 1600 cc. of turbid fluid which cultured Type XIV pneumococcus was removed. The abdominal tap had no effect on the child's dyspnea. He was started on sulfadiazine immediately and twenty hours after admission was also given 12,000 units of anti pneumococcic rabbit serum intravenously. This was followed by 10,000 units every six hours. He received a total of 55,000 units. On the second hospital day his temperature began to fall, his blood pressure fell to 120/90 and he seemed more alert. Shortly after this he was given 200 cc. of citrated type A blood without immediate reaction. Twelve hours later he became cyanotic, semistuporous and his blood pressure fell to 80/62. His pulse became imperceptible and his temperature rose to 105.2 F. Heart sounds at this time were very faint, and a gallop rhythm developed. He was then given one cat unit of digalen intramuscularly, one-half cat unit being given two hours later, and placed in an oxygen box. He declined steadily, however, and died five hours later on the fourth hospital day.

Final clinical diagnosis: Mixed type of lipoid nephrosis; bacteremia—type XIV pneumococcus; peritonitis—type XIV pneumococcus; broncholobular pneumonia.

Autopsy findings. Anatomical diagnosis: lipoid nephrosis, pericardial effusion, lobular pneumonia, right and left lower lobes, bacteremia, type XIV pneumococcus, peritonitis, fibrinopurulent, generalized, type XIV pneumococcus, hypertrophy of heart.

The body was that of a pale, well-developed, well-nourished, white male child. There was a marked distension of the entire abdominal wall. There was marked edema of the extremities and puffiness of the extremities. On opening the peritoneal cavity 800 cc. of grayish white purulent fluid escaped. The peritoneum was covered in numerous areas by a thin fibrinous flaking.

Heart. The pericardium was edematous. The pericardial sac contained about 30 cc. of clear straw-colored fluid. The heart was of normal shape. There was no enlargement of any chamber of the heart. The right ventricle was of normal thickness. All the valves were normal. There was minimal enlargement of the left ventricular wall with a suggestive flattening of the trabeculae carnae.

Lungs. The surface of the lungs was grayish red. The lower lobes felt firm and subcrepitant. On section, both lower lobes were a deep purplish red and subcrepitant.

Liver. The liver was of normal size and brownish yellow in color. On section it had a brownish-yellow color with a well preserved lobular pattern.

Spleen. The spleen weighed 50 grams. On section it was a deep purple and the pulp was extremely firm. The follicles were distinct.

Pancreas. The pancreas was of normal size. The lobular pattern was distinct.

Adrenals. The adrenals were normal in size, shape and position. On section the cortex and medulla were of normal width and sharply demarcated.

Kidneys. There was a normal amount of perirenal fat. The kidneys were exceedingly large, one weighing 120 grams and the other 150 grams. The capsule stripped with ease. The surface of each kidney was pinkish brown in color and sharply demarcated from the medulla. The pelves and ureters were normal. The bladder was of normal size and the mucosa showed no changes.

Gastro-intestinal tract. The esophagus was normal. There were several submucosal gastric hemorrhages, most of them occurring along the greater curvature. The small intestine was normal. There were several submucosal hemorrhages in the rectosigmoid.

Microscopic examination: Heart. The myocardial fibers were moderately hypertrophied in some areas.

Lungs. There was a fibrosis of the pleura. The alveolar walls were congested. Some alveoli were collapsed. Others contained an exudate of polymorphonuclear leukocytes, lymphocytes, large mononuclear cells and erythrocytes. Some of the bronchi had a lymphocytic infiltration in the walls, and the lumen contained erythrocytes. Liver, spleen, pancreas and adrenals were normal.

Kidneys. There was a rare hyalinized glomerulus, and a few glomeruli showed thickening of basement membranes. A rare glomerulus showed adhesions and proliferation of the capsular cells suggestive of crescent formation. There was a slight increase in interstitial fibrous tissue with an infiltration of lymphocytes and plasma cells. There were numerous dilated tubules. The tubular epithelium showed hyaline droplets. A few tubules showed calcifications. Fat stains revealed fat in the epithelium of some convoluted tubules and glomeruli. Azo-carmine stain demonstrated thickened basement membranes in a very few glomeruli.

Post mortem culture of heart's blood, pericardial fluid, abdominal fluid and lung all showed pneumococcus, type XIV.

DISCUSSION

This child's illness was characterized by chronicity, severe albuminuria, marked edema, oliguria, low plasma proteins, hypercholesterolemia, normal nonprotein nitrogen, microscopic hematuria on several occasions, hypertension and a terminal broncholobular pneumonia and pneumococcic peritonitis. According to a strict definition of lipoid nephrosis, no case should be included in which there is any elevation of blood pressure, impaired kidney function or blood in the urine. The more thoroughly a patient is studied, however, the more frequently some deviation from the pure type of nephrosis is found.[10b,11,12,17]

At autopsy, although numerous dilated kidney tubules were found, no findings consistent with definite diagnosis of glomerulonephritis were found.[14] A few glomerular capillaries were found to have thickened basement membranes. In many cases of lipoid nephrosis which come to autopsy, the glomeruli show no changes at all, but in others there is patchy or diffuse thickening of the glomerular capillary basement membranes and also an increase in the capillary endothelium.[10a,10b,17] Bell has studied five cases of lipoid nephrosis which started out as the pure type and finally died in uremia.[15] The so-called pure nephrotic kidney may then be regarded as a form of glomerulonephritis in which the capillaries are damaged but are not completely obstructed.[10a,10b,17] The development of hypertension and renal insufficiency is due to progressive thickening of the capillary walls which brings about eventual obliteration of the glomerular filter. It is not a primary tubular disease.[10a,10b,15,18] The changes in the tubules follow the changes in the glomerular capillary basement membranes.

Conclusion

A case of lipoid nephrosis which occurred in a white boy of 26 months of age is presented. The child, who had symptoms for 21 months, finally died of a terminal type XIV pneumococcic peritonitis and broncholobular pneumonia. At autopsy, the changes characteristic of lipoid nephrosis were found in the kidneys. No findings consistent with the diagnosis of glomerulonephritis were seen.

This case and findings of other authors presented in this paper suggest that lipoid nephrosis may be simply a type of glomerulonephritis which is due to alterations in the glomerular filter allowing large amounts of albumin to pass into the urine and be excreted. These alterations consist in thickening of the capillary basement membranes and increased capillary endothelium. As the disease progresses, some patients eventually show signs of renal insufficiency and hypertension due to further thickening of the basement membranes and increased capillary endothelium.

About 25 per cent of patients with lipoid nephrosis recover; some die when the stage of renal insufficiency and hypertension is reached; and some die of intercurrent infection, most often pneumococcic peritonitis.

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1949 BIRTH LEVEL HIGH

Births during the first nine months of 1949 continued at a high level, according to figures released by Oscar R. Ewing, Administrator, Federal Security Agency. Estimates for the continental United States prepared by the National Office of Vital Statistics of the Public Health Service indicate that 2,669,000 registered births occurred in the first nine months of 1949. The estimated birth rate for these months, on an annual basis, was 24.1 per 1,000 population excluding the armed forces overseas.

Diabetes Detection in North Dakota*

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It is now well established that approximately one million persons in the United States have the disease diabetes mellitus and are unaware of it. This startling fact inspired the American Diabetes Association to sponsor nation-wide "Diabetes Week," which was first inaugurated during the week of December 6 through 12, 1948. The program was fully endorsed by the American Medical Association. October 10 through 16 was national "Diabetes Week" for 1949, and several hundred thousand free urinalyses were performed throughout the nation in various detection centers. This has been made possible through the cooperation of over three hundred medical societies and several hundred diabetes detection committees. Thus far the free testing for diabetes has consisted solely of urinalyses, because even the rapid blood sugar screening test devised by Wilkerson-Heftmann of the United States Public Health Service is too time-consuming and expensive to incorporate in mass surveys. It necessarily follows that a considerable number of diabetics will escape detection, because a urinalysis is by no means a fool-proof detection device. However, on the basis of urinalysis alone, approximately one per cent new cases are being found among the general population.

The state of North Dakota has taken an active part in diabetes detection. During "Diabetes Week" of 1948 a "pilot test" was carried out in the city of Grand Forks, where 1,810 persons were screened, yielding a total of 16 proven cases of diabetes mellitus which were previously unknown. This incidence was comparable with that reported from other detection centers on a nation-wide basis. The success of the Grand Forks detection drive prompted the North Dakota State Medical Association to endorse state-wide participation in diabetes detection during "Diabetes Week" for 1949.

Members of the North Dakota State Diabetes Detection Committee were the following: Clarence V. Bateman, M.D., Wahpeton; H. A. LaFleur, M.D., Mayville; R. W. Rogers, M.D., Dickinson; A. R. Sorenson, M.D., Minot; A. K. Johnson, M.D., Williston; R. F. Gilliland, M.D., Carrington; Tom Pederson, M.D., Jamestown; R. B. Radl, M.D., Bismarck; T. Q. Benson, M.D., Grand Forks; G. W. Toomey, M.D., Devils Lake; William A. Stafne, M.D., and Lester Wold, M.D., Fargo; O. W. Johnson, M.D., Rugby.

While final reports are not available as yet from the ten district medical societies who participated in the program, preliminary reports indicate that approximately twelve thousand tests were performed and that the incidence of new cases is consistent with the national trend, or approximately one per cent. The state-wide detection program was executed as an entirely gratuitous service to the public at large. Considerable expense was involved, but this was borne by the American Diabetes Association and constituent societies of the North Dakota State Medical Association.

It is hoped that the state of North Dakota will participate annually in national "Diabetes Week" in retrospect of the success of the 1949 program. Furthermore, the American Diabetes Association has asked that diabetes detection be carried on throughout the year and that all local physicians cooperate in performing free urine tests for sugar. The public health aspects of diabetes mellitus are of momentous import, as evidenced by the following statistics: (1) The recent knowledge that one million unknown diabetics exist in this country brings the total of persons currently afflicted with this disease to two million. (2) Spiegelman and Marks (American Journal Public Health, vol. 6, p. 26, 1946) of the statistical department of the Metropolitan Life Insurance Company, estimate that nearly four million Americans now living will eventually have diabetes. This suggests that the number of diabetics will increase at a much greater rate than the population and that the problem of diabetes will gain in importance. For example, it may be estimated that while our total population as of 1940 will have increased 22 per cent by 1985, the diabetic population will have simultaneously increased by 74 per cent. (3) Diabetes is thus a major chronic disease. In numbers affected it is outranked only by heart disease and its related blood vessel and kidney disorders and by cancer and rheumatism. Yet it is unique in comparison with the latter diseases in that medical science has provided a specific means of control via insulin and diet, insuring longevity. No comparable specific treatment is available for any other major chronic disease. Diabetes detection should be combined with diabetes prevention. Education of the public in the nature and prevention of diabetes should be stressed in public health programs. The importance of heredity and obesity cannot be overemphasized. In the words of Joslin "Of all the inciting causes of diabetes obesity stands foremost." Heredity may be considered of nearly equal importance in view of the fact that one-fourth of the inhabitants of this country have diabetic relatives. Doubtless the incidence of diabetic relatives is much higher, but the family history is obscured by lack of information. Intermarriage of diabetics should be actively discouraged, inasmuch as diabetes is a Mendelian recessive trait which implies that 100 per cent of children born of parents who are both diabetic are potential diabetics.

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*Read before the annual meeting of the North Dakota Public Health Association, Grand Forks, North Dakota, November 11, 1949.

†Chairman, North Dakota Diabetes Detection Committee.

There is current need for public health officials to aid in clarifying a serious misconception created in the recent statement by Dr. Michael Somogyi, biochemist at Jewish Hospital in St. Louis, Missouri. Dr. Somogyi, who is not a doctor of medicine, declared that insulin is now almost totally outmoded by a new diet for diabetics and that only one per cent of diabetics require the hormone. Insulin was also characterized as a "poison" by Dr. Somogyi.

Unfortunately this statement had been released to the Associated Press before it could be attacked by qualified specialists in diabetes. Dr. Howard F. Root, President of the American Diabetes Association, issued a counter-statement which, unfortunately, did not enjoy the widespread dissemination of the Somogyi statement. In effect, Dr. Root stated that insulin is neither a poison nor a habit-forming drug and that the average diabetic requires insulin to prevent complications or even death. Approximately 50 per cent of diabetics require insulin. Until a careful assessment is made of the work of Dr. Somogyi and his associates, and until other investigators confirm their findings, it is impossible to generalize about elimination of insulin from the treatment program of the average diabetic.

The United States Public Health Service deserves high commendation for laying the groundwork as a stimulus to discover the million unknown diabetics. The diabetes detection program in Oxford, Massachusetts, under the direction of Dr. Hugh L. C. Wilkerson, chief of the Diabetes Section of the United States Public Health Service, yielded the first convincing evidence that approximatly one in every hundred persons has diabetes which is undiagnosed.

In conclusion, Public Health Associations, whether national, state or local, are in a most strategic position to render invaluable public service in diabetes detection and prevention.

NUTRITIONAL USE OF IODIZED SALT

An educational program to encourage the nutritional use of iodized table salt is forecast in an article written by Dr. William H. Sebrell appearing in a recent issue of Public Health Reports, a publication for professional public health workers issued by the Public Health Service, Federal Security Agency.

The campaign is being planned by the major producers of table salt, with the advice and cooperation of the medical profession and of government nutrition and health experts.

The following is a condensed summary of Dr. Sebrell's facts about iodine and health:

The role of iodine in the prevention of goiter has long been known, and iodized table salt has been available for many years. However, the present campaign, while stressing goiter-prevention, is also pivoted on the results of medical research into the significance of "trace" elements—of which iodine is one of the most important—in maintaining general health as well as preventing specific diseases.

The elements are these—iron, copper, phosphorus, zinc and many others could be listed as well as iodine—which are found in minute quantities in the soil and in plants and animal bodies. It is now known that they play essential roles in maintaining cell metabolism and regulating glandular functions, and in other ways. Sometimes individuals fail to get enough of them in their food (sometimes because they are naturally absent from the soil in which the food is grown, or have been leached out by erosion). In such cases serious illness can result—but just as often, or oftener, the result may be lowered efficiency, nervousness, or lack of energy. Too vague for any specific diagnosis, such a generalized malaise may weaken the individual's capacity throughout much or all of his lifetime.

One of the elements which is essential to health is iodine. This is because the thyroid gland, which controls so many major bodily functions, requires iodine for its own proper functioning. When it fails to get enough, conditions can result ranging from goiter to chronic borderline malnutrition.

Failure of the body to get enough iodine for the needs of the thyroid gland can occur for reasons as various as the kind of soil and modern merchandising practices. The soil or drinking water, on the one hand, may be devoid of iodine. On the other hand, people living near seacoasts should, theoretically, get enough iodine from the food available in their communities. But nowadays so much food is produced far from the areas where it is distributed, that the average housewife cannot be sure that what she buys contains enough iodine for her family's needs.

The thyroid gland takes up iodine from the bloodstream and uses it to form a hormone, thyroxine. This hormone in turn regulates such body functions as heat production, growth of hair, bones and skin, development of the brain, and sexual maturation at puberty.

The thyroid is a large U-shaped gland in the neck on either side of the windpipe. Weighing between one and two ounces, it is usually slightly larger in women than in men.

In function, the thyroid gland is both a factory and a warehouse. Alone among all the bodily tissues, it has an affinity for iodine, which it absorbs and oxidizes. This is the beginning of a complicated chemical process which chemists have studied in the thyroid gland, the end-result of which is the production of the hormone, thyroxine. This hormone is stored in a fluid inside the gland, and released into the bloodstream as needed.

Simple goiter is the commonest form. Although rare along seacoasts and not evenly distributed elsewhere, it is found in all parts of the world. It is often associated with periods like puberty, pregnancy or lactation, when exceptional demands for thyroxine are made by the body on the thyroid gland, and disappears afterwards.

A Clinical Evaluation of Chlor-Trimeton

William Sawyer Eisenstadt, M.D.
Minneapolis, Minnesota

CHLOR-TRIMETON MALEATE* (S-190) is the maleic acid salt of a new compound derived from the antihistaminic substance Trimeton. It has markedly increased pharmacological activity as compared with the parent substance, but has substantially the same order of toxicity. Hence, for clinical application, it has a much higher therapeutic index. Aside from the greater antihistaminic potency, the new compound exhibits several interesting differences in pharmacological properties, the result of a single halogen substitution in the parent molecule.

CHEMISTRY

Chlor-Trimeton Maleate is 1-(p-chlorophenyl)-1-(2-pyridyl)-3-N, N-dimethylpropylamine maleate, the base having the structural formula as shown below. It differs from Trimeton only in respect to the chloro-substitution in the phenyl group.

PHARMACOLOGY

In comparing the antihistaminic activity of Chlor-Trimeton with Trimeton, the therapeutic index was found to be approximately 15 times that of the latter.

In dogs, the compound potentiates the increase in blood pressure produced by epinephrine and inhibits the depression produced by histamine. In chicks, the compound exerts a central stimulating action similar to that of amphetamine (Benzedrine), unlike some antihistaminic compounds which are depressant.

CLINICAL STUDY

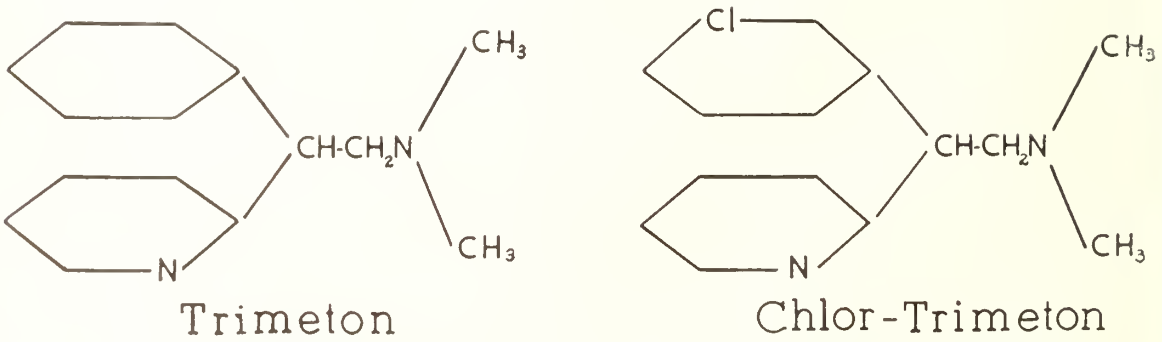
A series of 86 adult allergy patients were seen during the 1949 fall ragweed hayfever season, during the period of heaviest pollination. Most of these patients manifested some form of respiratory allergy. Hayfever alone, or hayfever with bronchial asthma of the seasonal type accounted for 60 of the above 86 cases. Nonseasonal allergic rhinitis, bronchial asthma, and urticaria made up the other 26 cases. These patients received either preseasonal or coseasonal hyposensitization for their symptoms and were given Chlor-Trimeton because they had not received complete relief. The response could be evaluated readily. If relief occurred, it was usually definite within 30 minutes.

Chlor-Trimeton was administered in the experimental tablet, which was a 2 mgm. scored tablet. The patients were instructed to take the drug only when symptoms were present. The dose generally used was 2 to 4 mgms. (1 to 2 tablets) one to four times daily, taken orally. The amount of drug taken and the number of doses required per day had to be adjusted to the patient's individual requirement. Chlor-Trimeton is now available in a 4 mgm. scored tablet. The results were classified as "Satisfactory Relief" or "No Relief."

The treatment of a group of 60 patients with hayfever was augmented with Chlor-Trimeton (Table I).

TABLE I
Results of Treatment with Chlor-Trimeton

Allergic Condition	No. of Cases	Satisfactory Relief	No Relief	Relieved
Hayfever (ragweed)	60	51	9	85%
Nonseasonal allergic rhinitis	13	9	4	69%
Bronchial asthma (intrinsic?)	4	0	4	0%
Chronic urticaria	9	6	3	67%



Trimeton Chlor-Trimeton

Fig. 1. Structural formula of Chlor-Trimeton Maleate.

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*Chlor-Trimeton Maleate was supplied through the courtesy of the Schering Corporation, Bloomfield, New Jersey.

Fifty-one, or 85 per cent, of the 60 patients received satisfactory relief. Nine received no relief.

Thirteen cases of nonseasonal allergic rhinitis were treated. Because other forms of therapy, such as elimination of positive foods, avoidance of positive inhalants, and dust hyposensitization did not give complete relief, Chlor-Trimeton was given. Nine, or 69 per cent, of these patients received satisfactory relief, and four were without benefit.

Included in this series were four patients with chronic bronchial asthma marked by an absence of positive skin tests, none of whom were benefited.

Nine cases of chronic urticaria were treated with Chlor-Trimeton. Six, or 67 per cent, were adequately relieved, three received no benefit.

Side effects occurred in eight of the 86 cases, an incidence of 9.3 per cent (Table II). These reactions were not severe and readily disappeared upon discontinuance of the drug. Three patients had headache. There were three who were excessively stimulated and nervous. One noted dizziness, while there was only one case of drowsiness.

Table II

Side Reactions with Chlor-Trimeton—8 Cases (9.3%)

Side Reaction	No. of Cases
Headache	3
Nervousness and excessive stimulation	3
Drowsiness	1
Dizziness	1

Comment

It is evident from the above observations that Chlor-Trimeton is an effective histamine antagonist when used as an adjunct to hyposensitization therapy in the treatment of seasonal hayfever. It has a relatively low incidence of side reactions. In nonseasonal allergic rhinitis it is somewhat less effective, while its effectiveness in bronchial asthma is negligible. In chronic urticaria, its effectiveness compares favorably with other antihistaminic compounds.

It must be emphasized that the antihistaminic drugs are palliative remedies only. On discontinuance of the drug, symptoms recur immediately. They certainly do not relieve the physician from attempting to recognize the offending allergens and to eliminate or hyposensitize against them. The antihistaminic drugs are a valuable adjunct to specific hyposensitization when the latter does not completely control symptoms.

Summary

1. Chlor-Trimeton, a new antihistaminic drug, was clinically effective in controlling symptoms in a series of 86 allergic patients.

2. Fifty-one (85 per cent) of 60 patients who received Chlor-Trimeton as an adjunct to specific hyposensitization for hayfever received satisfactory relief.

3. Chlor-Trimeton was also effective in controlling non-seasonal allergic rhinitis (69 per cent), and in chronic urticaria (67 per cent).

4. Its effectiveness in chronic bronchial asthma was negligible.

5. A rather low incidence of side effects (9.3 per cent) was noted in this series.

References

1. Tislow, R., and others: Fed. Proc. 8:35.04 90615, 1949.

SWAMP CAUSES FUNGUS INFECTION

Angle worms, a swamp, and 10 Madison (Wisconsin) residents are the clues Madison doctors are using to trace a fungus infection which grows in the lung. Doctors became aware of the fungus disease when x-rays in mass tuberculosis surveys showed spots on the lungs of some people who apparently did not have tuberculosis. Although none of the Madison patients died, the disease they had is known to have caused severe illness and death in patients elsewhere in the country.

When a disease similar to the fungus growth found in Kansas and Virginia patients showed up in Madison, local physicians, the city health department, and the University of Wisconsin's department of preventative medicine and student health pooled their efforts in a search for the source of infection.

One clue, which links all of the cases, is that each patient has visited the same swamp in the outskirts of Madison to dig angle worms for fishing. Evidence seems to free the angle worm, so the swamp's abundant populations of mosquitoes, rats, and pheasants are being considered as possible sources in any new outbreaks next summer.

The
JOURNAL
LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology

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Editorial

COMING—OUR 80th ANNIVERSARY ISSUE

On the bookshelf in the editorial office is a copy of the first issue of our magazine, published in 1870, just 80 full years ago. The pages are a little brown around the edges, but the paper is as firm and the printing as clear as when it first came off the press in St. Paul in 1870. The articles, prepared so long ago, are well written and scholarly. We are proud of this first volume, and prouder still of all the 79 volumes of the journal that have appeared since that date. We believe they represent a tangible and valuable contribution to the history of midwestern medicine.

Eighteen hundred and seventy in Minnesota . . . what was it like here then? St. Paul was a bustling young river port, St. Anthony a village of new frame houses, Minneapolis a lumber town strident with sawmills. Down in Rochester, William Worrall Mayo was making his first dramatic and successful explorations of the abdomen. There were the beginnings of a university. Farther west, in the Dakotas, the new settlements were filling up rapidly, all needing and drawing new doctors from the east.

That year, to serve the needs of a frontier territory, our journal, then known as the *Northwestern Journal of Medicine and Surgery,* made its first appearance. Although our physicians were fewer in number, those who were here were progressive and forward looking, and had already organized their state and county medical societies. These men were our first readers and subscribers. Today, 80 years later, some of their sons and grandsons are constant and enthusiastic readers of Journal-Lancet.

We believe this 80th anniversary calls for something very special in the way of recognition. To mark the occasion properly, Journal-Lancet has prepared for February, 1950 a most unusual issue, with a handsome new cover, and feature articles written by some of the most honored names among the doctors of the upper midwest. These articles will give you the story of medicine in the various states of this area. And other articles, a unique *Then and Now* series, will demonstrate entertainingly and dramatically, the progress in the various fields of medicine in the past 80 years.

Watch for it. Celebrate with us. It's coming next month—our 80th anniversary issue!

American College Health Association News

The local sections of the Association reported annual meetings in October and November. It is encouraging to note that at least four regional groups have held meetings in 1949. No information has been received from the other local sections.

The Rocky Mountain Section met at the University of Wyoming in October. Dr. Roger Whitney, College Medical Adviser, Colorado College, was elected President. The question of regrouping of colleges in this section was discussed at some length. The colleges in this section are being contacted to determine their wishes in the matter.

The Pacific Coast Section met at Claremont, California, as guests of The Associated Colleges at Claremont. The setting was ideal for the two-day conference. The seventy-five delegates in attendance represented twenty-six institutions. A report of a survey of the health program of nine State colleges was presented. The survey was the outcome of a recommendation from this section to the State Department of Education, suggesting the need for better facilities and services in the State colleges. Improvements in the program of these colleges are underway. Topics receiving emphasis in papers and discussion were "New Trends in College Health Services" and "Contributions of the Health Educator to the College Health Program." Upon the invitation of Dr. Fred Miller, University of Oregon, the Pacific Coast Section will meet at Eugene, Oregon, Thanksgiving, 1950. The officers elected for the following year are:

President, Dr. Fred Miller, University of Oregon; President-elect, Dr. Donald MacKinnon, University of California at Los Angeles; Secretary-Treasurer, Miss Ethel Medley, San Francisco State College; Member-at-large, Dr. Gilbert Coltrin, Claremont Colleges.

Changes in Staff:

Dr. Lillian Warnshuis is Director of Health Services at Connecticut College, New London. Dr. Warnshuis is a graduate of Edinburgh University and has been in private practice in New York and in India. A new infirmary is under construction at this institution.

Dr. Paul F. MacLeod replaces Dr. Dan G. Stine as Director of Student Health Service of the University of Missouri.

Dr. Ralph I. Canuteson, University of Kansas, reports the following new staff members: Dr. Sigmund Gundle, psychiatrist; Dr. Bernard L. Harden; Dr. R. W. McClure; Dr. W. C. Flemming.

At a recent meeting of the American Ophthalmological Society, Dr. Richard C. Gamble was reappointed as its representative on the Eye Health Committee.

Opportunities Open

MISSISSIPPI VALLEY MEDICAL SOCIETY 1950 ESSAY CONTEST

The Tenth Annual Essay Contest of the Mississippi Valley Medical Society will be held in 1950. The Society will offer a cash prize of $100.00, a gold medal, and a certificate of award for the best unpublished essay on any subject of general medical interest (including medical economics and education) and practical value to the general practitioner of medicine. Certificates of merit may also be granted to the physicians whose essays are rated second and third best. Contestants must be members of the American Medical Association who are residents and citizens of the United States. The winner will be invited to present his contribution before the Fifteenth Annual Meeting of the Mississippi Valley Medical Society to be held in Springfield, Illinois, September 27, 28, 29, 1950, the Society reserving the exclusive right to first publish the essay in its official publication—the Mississippi Valley Medical Journal (incorporating the Radiologic Review). All contributions shall be typewritten in English in manuscript form, submitted in five copies, not to exceed 5000 words, and must be received not later than May 1, 1950. The winning essays in the 1949 contest appear in the January 1950 issue of the Mississippi Valley Medical Journal (Quincy, Illinois).

Further details may be secured from Harold Swanberg, M.D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Illinois.

RESEARCH FELLOWSHIPS

The National Foundation for Infantile Paralysis announces that it is offering postgraduate research fellowships for one to three years in the fields of virology, orthopedic surgery, pediatrics, epidemiology, and neurology. These fellowships are available to properly qualified candidates whose objectives are research and teaching in these fields.

Eligibility requirements include United States citizenship; sound health; degree of Doctor of Medicine or Doctor of Pihlosophy; two years' residency training in the specialty; and a program of study and detailed plan of investigation.

Additional information and applications may be obtained from Professional Education Division, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N. Y.

STERILITY AWARD

The American Society for the Study of Sterility is offering an Annual Award of $1,000 known as the Ortho Award for an essay on the result of some clinical or laboratory research pertinent to the field of sterility. Competition is open to those who are in clinical practice as well as to individuals whose work is restricted to research in basic fields or full time teaching positions. The prize essay will appear on the program of the forthcoming meeting of the American Society for the Study of Sterility, which is to be held at the Sir Francis Drake Hotel in San Francisco on June 24 and 25, 1950.

Full particulars may be obtained from the Secretary, Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield, Massachusetts. Essays must be in his hands by April 1, 1950.

EXAMINATION FOR SCIENTIST

A competitive examination for appointment of officers as Scientists (Bacteriologists) to the Regular Corps of the United States Public Health Service will be held on March 20, 21, and 22, 1950. Examinations will be held at a number of points throughout the United States located as centrally as possible in relation to the homes of candidates. Applications must be received no later than February 20, 1950.

Future Meetings

MINNESOTA is embarking upon an extensive five-year program of state-wide professional postgraduate education. Doctors, dentists, nurses, and pharmacists have been invited to a series of district seminars devoted to heart disease, cancer, and psychosomatic medicine.

Each seminar consists of eight consecutive weekly meetings, with two lecturers usually appearing for one hour each. There are six lectures devoted to heart disease, six to cancer, and four to mental health.

The Minnesota Department of Health is planning and organizing the programs with the assistance of the University of Minnesota Schools of Medicine, Dentistry, Nursing, and Pharmacy; the Minnesota State Medical Association, the Minnesota State Dental Association, the Minnesota Nurses Association, and the Minnesota State Pharmaceutical Association.

The first of the seven seminars scheduled for the 1949-1950 season has been successfully completed at Bemidji with an average attendance of twenty-five physicians and thirty nurses at each meeting. Fergus Falls, the second site chosen for a seminar, is currently in progress and the first six sessions have attracted an average of thirty-five physicians, fifty nurses, and thirty dentists for each meeting.

A course in pediatrics for general physicians also will be presented at the Center on January 26-28, 1950. The course will be divided into three major divisions. The first period will be devoted to the importance of hereditary and genetic factors in understanding pediatric problems; the second will emphasize common dermatological problems seen in infants and children; common infectious diseases will be considered in the third portion of the course.

A continuation course in cancer will be presented on February 16 to 18, 1950. This course is sponsored by the Minnesota State Medical Association, the Minnesota Division of the American Cancer Society, and the Cancer Control Division of the Minnesota Department of Health.

NOTICE OF ANNUAL MEETING

June 24-25, 1950, The American Society for the Study of Sterility, Sir Francis Drake Hotel, San Francisco, California, Secretary-Treasurer, Walter W. Williams, M.D., 20 Magnolia Terrace, Springfield 8, Mass.

NATIONAL CONFERENCE ON HEART DISEASE IN JANUARY

A National Conference on Cardiovascular Diseases will be held January 18-20, 1950, at the Mayflower Hotel, Washington, D. C. The conference is jointly sponsored by the National Heart Institute and the American Heart Association.

News Briefs

North Dakota

PHYSICIANS from Bismarck, Beach, Hettinger, Dickinson and Mott met in Mott on November 12 for their Southwestern District medical meeting. Dr. Radl of the Quain and Ramstad clinic of Bismarck was the principal speaker and spoke on "Progress in Medicine." Dr. Dukart of Dickinson was the presiding officer.

THE third annual North Dakota cerebral palsy clinic was held in Minot, with the Northwest Clinic serving as host, on Dec. 5 and 6. Guest director for the clinic was Dr. Meyer A. Perlstein, nationally known pediatrician and specialist on cerebral palsy. Approximately 30 cerebral palsy children from throughout North Dakota participated in the teaching-demonstration.

DR. S. B. SEITZ, formerly of Barnesville, Minnesota, has arrived in Richardton to organize a clinic for the new, modern, $100,000 Richardton Memorial hospital scheduled for occupancy by January 1. The doctor is a 1936 graduate of the Northwestern university medical college.

DR. ELLIS A. CANTERBURY of Peoria, Illinois, a former Grand Forks physician, is one of three Northwestern university allergy experts who have devised skin tests to determine the potential value of new anti-histamine drugs.

FORMATION of all-inclusive organizations to handle community health was urged by Dr. F. S. Crockett of Chicago, chairman of the committee on rural health of the American Medical association at closing day session of the sixth annual convention of the North Dakota Public Health associations at Grand Forks on November 19.

Irma Bloch of Bottineau was named vice president at the closing business session and Q. D. Gonser of Bismarck, secretary. New council members for two years are Dr. R. O. Saxvik and Lynn Byrne, Willis Van Heuvelan and Laura Smith for one year. President Melvin E. Koons of Grand Forks and Treasurer Milla Tollefson of Bismarck hold office for another year.

DR. FELIX F. VONNEGUT, Emmons county doctor, recently walked out of a delivery room at Linton after bringing his 2500th baby into the world, and headed for a long vacation on the West Coast.

The veteran physician was a medical student in Germany at the outbreak of World War I and spent the war years as an enemy alien in Germany. He began his practice in North Dakota at Hague in August, 1922, and remained there for over 21 years. He moved to Linton in October, 1943.

SOME aspects of colon surgery were discussed by Dr. B. Marden Black, Mayo clinic surgeon, at the November 9 meeting of the Grand Forks district medical society in the Dacotah hotel at Grand Forks.

DR. ROBERT G. ROGERS, staff surgeon with the Dakota Clinic, Fargo, was notified this week he had passed final examinations and had been designated a diplomate of the American Board of Surgery. Two other Fargo physicians, Dr. L. G. Pray of Fargo Clinic and Dr. B. A. Mazur of Dakota Clinic, pediatricians, attended a meeting of the American Academy of Pediatrics at San Francisco, November 14-17.

AN ORAL CANCER SYMPOSIUM was held in the Gardner hotel in Fargo on December 3 sponsored by the North Dakota State Dental Association, the Southeast District Dental Society, and the State Cancer Society. Dentists, interested physicians, and pathologists attended the meeting.

A NURSES' STATION on the third floor of Trinity hospital at Minot has been established as a memorial to Dr. Andrew Carr, who was active in the founding of the institution.

Dr. Carr was born near Logansport, Indiana, June 7, 1854, and when 2 years old moved with his family to Fillmore county, Minnesota, by covered wagon. He lived in Minnesota 24 years, then moved to Nelson county, Dakota territory.

FOUR Devils Lake physicians, who have served the community for an aggregate of 188 years, were honored at the annual dinner meeting of the Devils Lake Chamber of Commerce in the Great Northern Hotel Empire Room December 15.

The four doctors are Dr. W. F. Sihler, who started practice at nearby Grand Harbor in 1899; Dr. G. F. Drew, who started practice at Crary in 1901; Dr. Clinton Smith, who came here in 1903; and Dr. G. J. McIntosh, who opened his office here in 1905. Dr. Smith is spending the winter at Miami, Florida, but will receive the same honors as the others.

Dr. W. A. Wright, Williston, president of the North Dakota Medical Society, was invited to pay the principal tribute.

ARRANGEMENTS now are completed for Dr. Bohdan Hordinsky to begin an internship at St. Michael's hospital at Grand Forks. Dr. Hordinsky is a displaced person, 38 years old, who received his medical training in Poland and who practiced in hospitals in that country for nine years. He has been in the United States for some time and has spent a year with St. James hospital in Newark, N. J.

Minnesota

DR. THOMAS H. SHELDON of Rochester, Minnesota, was installed recently as president of the American Association of Blood Banks.

The Tri-County Medical society met at Eibner's in New Ulm, on November 15. The society is composed of the Nicollet-LeSueur, Brown-Redwood, and Blue Earth counties.

DR. R. C. RADABAUGH of Hastings was awarded a medal for the best case report presented at the annual meeting of the Southern Minnesota Medical association held in Red Wing in September. The medal was sent to Dr. Radabaugh by Dr. W. A. Merritt, secretary-treasurer of the association.

DR. S. A. SLATER, interviewed on Sunday, November 20, on the weekly health hour sponsored by the auxiliary of the Southwestern Minnesota Medical Society, assessed the results of 30 years of operation of the Southwestern Minnesota sanatorium. Outstanding is the fact that the 56-bed institution, now serving ten counties instead of the original eight, is operating at only half capacity.

Duluth's medical fraternity was praised for "its fine spirit of science and research" by Dr. Gosta Dohlman, Swedish surgeon, recently. Dr. Dohlman, who presented the first David Tilderquist memorial lecture before the St. Louis County Medical society, is professor at the University of Lund, Sweden.

DR. R. O. SATHER spoke on "Arthritis and Rheumatic Fever" at the Crookston-Parnell Farm Bureau meeting Wednesday at school district 181.

MEDICINE in southeastern Minnesota before the turn of the century was the topic at the November 7 meeting of the Medical Historical society at the Mayo Foundation in Rochester. Mrs. Nora Guthrie was the principal speaker.

ABOUT 8:30 on the morning of November 26 Don H. Sleeper, operator of an amateur radio station in Fairhaven, Massachusetts, heard radio amateurs broadcasting from Munich, Germany, an appeal to American radio hams to try to reach Dr. H. D. Good of Minneapolis. The Munich report said Dr. Good was needed to help Kathleen Epperson, daughter of an Army sergeant, and the doctor's patient before her mother took her overseas.

The Munich station said transatlantic telephone calls had failed to get through to the doctor. Mr. Sleeper and a New Bedford friend, Clarence Whittaker, took over the message delivery and reached a Minneapolis ham, who got in touch with the doctor. The doctor's advice was relayed to Mr. Sleeper, who sent it on to Munich.

DR. ANDERSON C. HILDING, Duluth physician and surgeon, presented a paper at the 50th anniversary meeting of the Chicago Otological society December 5 in Chicago.

The Bethesda hospital building fund campaign in Crookston passed the $100,000 mark in a single sweep as the special gifts committee reported at a dinner meeting at the Crookston hotel on November 4.

GOVERNOR YOUNGDAHL has named Dr. Mellvin E. Lenander of St. Peter to membership on the Minnesota state board of medical examiners for a term ending May 1, 1954.

DR. FRANCIS W. LYNCH of the University of Minnesota Medical school was elected vice president of the American Academy of Dermatology and Syphilology on December 8.

DR. W. E. MACKLIN is locating in Willmar, where he will specialize in his work as a roentgenologist through the Rice Memorial Hospital.

Deaths

SERVICES for Dr. Jakob Hvoslef, 84, former chief of staff at Deaconess hospital, were held November 17.

Dr. Hvoslef, who practiced medicine in Minneapolis from 1892 until his retirement in 1923, had been associated with the hospital many years and also took an active part in building the present hospital.

He was the son of Fredrik Waldemar Hvoslef, bishop of Tromso, Norway, and later bishop of Bergen, Norway.

Dr. Hvoslef studied medicine at University of Oslo. He came to the United States in 1892.

He was a member of Hennepin County Medical society and American Medical association.

DR. THAYER C. DAVIS, 62, practicing physician in Wadena since 1922, died November 18 of a heart attack. He was associated in the Davis Clinic with his brother, Dr. Thomas Davis.

DR. WILLIAM LOWE, who practiced medicine until two years ago, died at Madison, S. D., November 15 at the age of 88.

DR. GEORGE R. DUNN, 62, Minneapolis surgeon, died December 11, in his home following a long illness.

He was born in Princeton, Minn. He was a graduate of Hamline university, St. Paul, and Johns Hopkins university, Baltimore, Md.

Dr. Dunn had served as clinical assistant professor of surgery at University of Minnesota and was president of the surgical staff of Northwestern hospital in 1941.

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Book Reviews

Intracranial Tumors, 2nd Ed., by PERCIVAL BAILEY, M.D. Chas. C. Thomas Co., 478 pages, 155 ills., 16 plates, $10.50.

- - - - - - - -

This work on intracranial tumors comprises one of the most systematic and clearly presented treatises ever written on this subject. Actually, the title of this book, namely, *Intracranial Tumors*, is a little modest. Dr. Bailey has subtly interwoven in his presentation a fairly adequate discussion of neurophysiology and clinical neurology.

The first three chapters of this book are devoted to a general discussion of a "few" fundamental anatomical and physiological concepts, including such subjects as arterial and venous supply of the brain, cerebral cytoarchitectonics, cerebrospinal fluid flow and the ventricular systems, cortical representation. These chapters are followed by a separate discussion of the more common intracranial neoplasms. The method chosen by the author for his discussion is a little unusual in texts but certainly makes for added interest. Each tumor type is introduced by one or two case histories presented as if a clinic were being given. These cases are used as an introduction to a more detailed discussion of the clinical and pathological aspects of the individual tumor types. All descriptions and discussions have been kept simple, brief but complete in every respect. Operative techniques have been reduced to a minimum and concentrated in a single small chapter at the end of the book. The illustrations are a little unusual. In order to avoid the glare of most photographs, the author has used drawings to illustrate the book. At first one may be a little disappointed in these illustrations but further study of them makes one feel more and more satisfied with them.

This book can be highly recommended to everyone in the profession as an example of excellency in medical writing. It can be particularly recommended to every student in the neurological sciences as a "must" in his reading and an invaluable addition to his library. A.B.B.

Failures in Psychiatric Treatment, edited by PAUL H. HOCH, M.D. New York: Grune and Stratton, 241 pages, $4.50, 1948.

- - - - - - - -

This book is a published record of the symposium on failures in psychiatric treatment which comprised the proceedings of the 37th annual meeting of the American Psychopathological Association held in New York in 1947. It is essentially a series of papers discussing the limitations and failures in the major divisions of psychiatric practice and in the more specific therapies, such as insulin and electroshock.

The introductory chapter is by Nolan D. C. Lewis, with a discussion by Samuel W. Hamilton. Other chapters and discussions are by equally authoritative and well-known authors. A summary of the symposium findings by the editor concludes the book. The chapter on psychoanalysis by Clarence Oberndorf is concerned chiefly with a discussion of the type of cases best treated by this method. The chapter on psychobiology by Muncie and Reneé gives the principles of this methodology. The short chapter on group psychotherapy by John Cotton is an excellent discussion of this new form of treatment. The chapters on insulin and electroshock offer many practical conclusions on the indications and contraindications of these therapies. Other subjects discussed are hypnosis, child psychiatry, treatment of criminals, psychosomatic therapy, lobotomy, epilepsy, central nervous system, syphilis, and social case work. The presentations for each subject are rather general and the various therapies are evaluated on a personal basis rather than by the presentation of definite statistics. This is explained by J. McVicker Hart in his discussion on failures in social case work as being due to lack of common criteria in either success or failure of individual cases. Other authors place the difficulty in nomenclature and delineation of clear-cut, diagnostic entities as a major handicap in compiling accurate statistics. The book is valuable in that it presents in a brief fashion an over-all picture of the indications and limitations of the common forms of therapy in psychiatric practice. W.C.

Rehabilitation, Its Principles and Practice, by JOHN E. DAIRS, M.D. New York: A. S. Barnes and Co., Inc., 264 pp.

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In this book the author discusses the problems of rehabilitation of the physically and mentally ill. He emphasizes the fact that good rehabilitation must be aggressive and aimed away from merely hospitalizing a patient in order to protect society. It must be directed at utilizing the patient's needs, interests, and capacities with the view of returning the individual to society as a functioning component. In order to institute practical rehabilitation the author discusses the importance of correlating the various techniques and approaches developed by the psychologist, psychiatrist, vocational and recreational specialists.

The author's philosophy is certainly plausible and well handled. This volume should be of value to the various groups who are participating in the rehabilitation of these emotionally ill individuals. A.B.B.

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The JOURNAL LANCET

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PREPARATION OF MANUSCRIPTS

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The JOURNAL LANCET

Minneapolis, Minnesota
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Vol. LXX, No. 2
New Series

Foreword

THE FIRST EIGHTY YEARS — AND THE NEXT

The Journal-Lancet has demonstrated by its growth through eight decades that it has served and is serving important needs of the medical profession in a large area of the country. A medical journal is a social institution, and as such has an obligation to examine periodically its record, its policies and its potential effectiveness to do its job to determine whether it is on the right track.

This journal has lived through the days of the frontier, the early settlements and the growth of the cities. It has seen the transitions from the doctor who was trained by the preceptor method, through the diploma mills and proprietary medical schools, to the system of scientific medical education which is mainly responsible for the high quality of training of physicians in 1950. The character of the practice of medicine has undergone a revolution since 1870.

The Journal-Lancet has attempted, with a fair measure of success, to meet the needs of a changing medical world in its first eighty years. It has a challenge in the years ahead to meet the needs of the future. One need not be a prophet to be able to predict the direction of the changes the medical world will see, because many changes are now in progress. The application of chemistry and physics to medicine is well under way, but it has only begun. The tantalizing hints we now have of the role endocrinology may play in the conquest of diseases ranging from rheumatic fever to allergies only serve to emphasize the tremendous possibilities of medical chemistry. Likewise in physics the present points to future gains. As to both fields medical journalism has a great opportunity for service because medical journals are the primary tools for informing the profession about advances.

The Journal-Lancet has an important part to play in helping the medical profession make and utilize the advances which the next years are bound to see. Its publishers and its editors recognize the challenge and intend to meet it.

Maurice B. Visscher, M.D.

An Outline of Minnesota's Medical History

Edward L. Tuohy, M.D.*
Duluth, Minnesota

Many young men in medicine would throw history out—adopting the cynical assay of Tallyrand—"History teaches chiefly that it teaches nothing." Obviously this appraisal holds much fact. The youth of every land make the best revolutionaries; they have the most time to gamble with life. The molding of every professional group enforces a degree of singlemindedness. "The power that comes with membership of a great professional cast," Sean O'Faolain points out in discussing the Irish clergy: "In short, the Priest while apparently not *of* this world is *in* it up to his neck."

In a series of headings largely unsupported by either argument or statistical data, I aim to give some of the explanation of what we may call this explosive and dynamic development in Minnesota. In point of fact I have some right to comment because I have lived through nearly three-quarters of a century of this development and shall refer to it later.

1. The region under discussion was ready for development. It offered security to those people capable of fighting for it; endowed solely with their native intelligence and skill with which to meet up with the fertile wilderness and capture from the earth its vast munificence. Toynbee, the current apostle of historical concepts and interpretation says that, "History arises out of a series of challenges and responses." This challenge and this response should lead us to ponder deeply upon our further Minnesota development and how we may safeguard it.

2. The equipment of those early Minnesota settlers included more than physical prowess. We may illustrate with R. G. Collingwood's concept of history—"History proper is the history of thought; there are no mere events in history." This gives us a hint as to why the study of history has been unpopular: too much about battles, events, deeds and names of the conspicuous folks of the periods. The news about Minnesota had penetrated into many of the European homelands. Famine, economic turmoil, political and landlord oppression and religious discrimination had produced a type of *thinking* that, like Kettering's idea of invention "begins as a thought process," gave unity of purpose of mind and heart to a wide variety of racial groups. That "way of life" without coercion or dictation was to exemplify again the glorious story of the seed falling on fallow ground.

3. A few words about *fallow ground*. The most indelible of all history is written in the rocks. The successive over-running of five glacial drifts apportioned and provided for this glorious land—its lakes and rivers; woods and prairies; unexampled fertile soil; indeed the priceless rocks and minerals under the soil which in turn gives timber; the unparalleled waterways; the fisheries; the fur-bearing animals and wild game—the perfect setup for immediate sustenance even though the rapid exhaustion of these our prehistoric inheritances represent a challenge for the future (conservationism).

4. The right kind of emigrants came to this right kind of land fully prepared to deal with its adverse attributes and the "know-how" to develop orderly competitive existence. With the cold wind of the cold war blowing at us through the microphones of many broadcasters, it is timely to remark that white men and women were going to Siberia at the same time, and before, the Minnesota area was being populated. The selfsame ice ages had contributed to vast areas of northern Asia in fertility and promise equal to that in Minnesota. We should remember also that not only did the Russians give their name to the water connection between Asia and North America but they even penetrated and built forts in California before they were displaced by the Spanish conquistadores from the south. But the name Minnesota was euphonious and inspiring; Siberia connoted chains, solitude and segregation. The Muscovite thought processes are no different today in Czechoslovakia than they were when Peter the Great sent Colonel Behring across Siberia to North America.

5. America was warming up for the industrial age. The groundwork had already been laid; New England had two centuries of progress, trial and experiment, and many had already heard of the fabulous middle west. Some came because of their health and the climate of Minnesota was said to cure consumption. The lines of communication with the East were becoming better and better established; there was a market for every worthwhile product; the railroads and the waterways were soon at hand for shipment. European investments had built up great "dollar surplus." Liverpool millers and merchants financed the northwest wheat grower. Chicago boomed and mushroomed and very soon every farm boy had either "McCormick" or "Deering" imprinted on the seat of his pants. The days of hand cultivation of the soil with bare subsistence in return did not obtain for long. Priceless individual skills like weaving, carpentry or stone-masonry were soon to be discarded after Henry Ford and Sears, Roebuck led the mass production schedules.

Furthermore, people came in consolidated units in succeeding waves, where the later comers found fellow country folk eager to share, with unheard-of enthusiasm, a country where they could actually own their own land and select their own methods of government. The less said about the displacement of the native Indians the better for our pride. It was one of the many historical inevitables. Indian medical lore was as impractical for the white man as the latter's way of life was for the red man. The two races were separated by a wall of at least one thousand years; based less upon intelligence than upon Collingwood's thought processes. Living the tribal way, the area was crowded when the whites came. With self-sacrifice beyond compare, the early Christian missionaries were all too few in numbers to adequately compete for the souls of the Indians the while their bodies were so thoroughly diseased (smallpox and syphilis) by the debauching white explorers and traders.

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*From the Department of Medicine, The Duluth Clinic, Duluth, Minnesota.

The Momentum of Migration and Men

This was the natural background, to which was added a concatenating set of events and sequences unparalleled in recent times. Between 1850 and the turn of the century medicine in terms of distribution and service, the development of medical education, provision of hospitals for the insane and handicapped as well as for the routine care of the fit and sturdy was to keep well in advance of facilities such as roads, bridges, terminals, docks, rail connections, telegraph and telephone—all of which knit together the Minnesota we know. Minnesota medicine owes a great debt to the colleges and universities in our eastern states and to the provinces of Canada for the many pioneer physicians who came into Minnesota after 1850. It might be supposed that among the great numbers who came, especially from the Scandinavian countries and Germany, that a considerable number of foreign trained physicians would come with the respective national groups; but that, with a few exceptions, did not prove to be the case. In the year of territorial designation (1849) there was said to have been only five thousand white people censused; but in 1860, there were 172 thousand. To indicate the Scandinavian influx: there was said to be only 12 of that origin in 1850, increasing to 12 thousand in 1860 but in 1890 there were 100 thousand Swedes, 102 thousand Norwegians and 14 thousand Danes. Between 1850 and 1860 German born increased from 147 to 18 thousand! In 1920 it was estimated that the foreign born and their children made up 64 per cent of Minnesota's population. The manner in which they came here and settled is too long a story for this record; the motivating purposes and agencies have already been inferred. Much medical history has already been written dealing with this period up to 1900. Most of it has been written up and published in the numbers of Minnesota Medicine (the official journal of the Minnesota State Medical Society) since the society designated "an historical committee" in 1928. To this record I shall presently refer, but before doing so I desire to give some of the reasons that occur to me why we *need more readers* of medical history because without them the worthwhileness that should redound to the profession will not be forthcoming.

Techniques of Historical Writing

Publishing medical history has been a labor of love as the representative of Paul B. Hoeber told me in the year 1928. Dr. Hilding Berglund led me up to the publisher's booth at a national medical meeting and said, "Buy all the back volumes and subscribe for the Annals of the Hsitory of Medicine." I did so and I have never made a better investment. Unhappily this great journal was one of the World War II casualties. One of the first articles I chanced upon on opening the uncut volumes held in essence this bit of advice, "Do not try to engulf medical history chronologically or en masse; pick out an item, a man, a disease or a period, follow it back source by source to original documents, copies thereof, sources of any kind anywhere available." We see that wonderfully exemplified in the sequence of the lives of William Osler and Harvey Cushing and now in the brilliant biography of the latter by John Fulton. The tie that links all these men together is the study of the life and writings of Andreas Vesalius; but what a wealth of medical history is unearthed, classified and incorporated into brilliant writing to stimulate in turn countless others.

Minnesota was invaded, as it were, by the Great Waterways (the Great Lakes and the Mississippi river). Grace Nute's "The Voyageurs" beautifully outlines the former as did Lovelace's "Early Candlelight" the latter. The early settlements were military forts soon to be followed by the erection of docks, storehouses and the other facilities wherever traffic is broken and the inland is traversed by other routes, canoe trails, stage lines, dirt roads, rail lines and ultimately the surfaced highways that were to carry the enormous motor traffic we know today. The Chicago, Milwaukee and St. Paul Railroad came to Winona in 1872, and the river traffic to St. Paul from Galena was made obsolete when at the end of 1872 "Minnesota had 1900 miles of railroad." From the standpoint of medical history in Minnesota this lively expansion may be sensed but not fully appreciated. As the railroads extended their tracks they dotted the lines every six or eight miles with stations. A good historical topic would be an analysis of the growth and development and later shrinkage as many of the settlements* dried up. In fact the process is still going on. The point to remember is that most of these way stations, even in early days, had medical service, at least of a type; and we begin to recognize what it meant to give this service at a time when saddle bag "doctoring" yielded to the various types of carts and buggies and the cartoonist version of the stork leading out ahead of the tired horses the while the distracted physician toiled through the mud at anywhere from two to four miles an hour! The tracing of the lives, the origins and the accomplishments of these early doctors has been the task of those men and women writing up the story of early medicine in Minnesota. The early doctors moved about a great deal as did many of the early settlers. No one has traced their peregrinations quite as fully and as vividly as Mrs. Nora H. Guthrey of Rochester, Minnesota. Mrs. Guthrey's researches and reportings may all be found in the volumes of Minnesota Medicine of the past 20 years. Since I grew up in Olmsted county her detailed accounting, through avid studies of old newspapers, legal documents and the results of personal interviews, has made me one of her enthusiastic fans. Writings and reports of a similar nature have been made for St. Louis and surrounding counties by Dr. Richard Bardon and Dr. Owen Parker and others; while for Hennepin county and Ramsey, the late Drs. A. W. Hamilton and John Armstrong have inspiring accounts. For the western half of the state a great deal of work is still to be done. Clapesattle's "The Doctors Mayo" you have all read and needs no reminder here. Dr. Monte C. Piper of the Mayo Clinic staff, chairman of the historical committee of the Minnesota State Medical Society, has been untiring in his pushing of this work and the support of Mrs. Guthrey's great work has resulted in part from his enlistment of interest on the part of the great Mayo Clinic and Foundation. This issue of Journal-Lancet is fortunate in having a review of the history of Minnesota's Medical School given by the distinguished professor of pathology, Dr. E. T. Bell. He, perhaps more than any other man, has helped in molding and preparing for medicine the sons of the Minnesota pioneers who have entered the field since the turn of the century. Many of our best doctors are the sons of Scandinavian ministers.

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*Nora Guthrey points out that a Dr. Golbreath located in Orinoco and a Dr. Cole in Marion at least two years before five people assembled in the crossroad—Rochester—that was to become the world's medical mecca. Orinoco is six miles north and Marion four miles south of Rochester on paved highway 53.

It must occur to many that a story of the founding and growth of a typical town that developed in this area would furnish a fascinating saga.* Such an inspiration came to Margaret Snyder. What was my delight in November, 1948, to have at hand just such a book, and of all things written about "my home town"! Miss Snyder, a former teacher in Chatfield, wrote "the story of a pioneer town" and gave it the name "The Chosen Valley." There, to my joy and amazement, was the story of my own people; our neighbors, our Norwegian, Bohemian and German communities, and the small oasis of Irish entirely surrounded by Scandinavians! I was born just 25 years after Chatfield was located—a land office post. Within the 30 or 35 years in which it may be assumed that I acquired *awareness* there must have been a great clatter of hammers and axes because the town was then covering as much area as it does now. But most of all was the account (supplementing Mrs. Guthrey's story) of the Drs. Augustus and "Met" Trow—father and son. The father attended my mother in her nine confinements and I was her eighth child.

Despite the editor's threat and limitation of space, I just must say something about the first doctor I met in Minnesota, Augustus Trow. He was born in 1832 and Margaret Snyder writes that he came from a medical college in Vermont. As did many doctors of his vintage, he doubled in his duties and was an ordained Baptist lay minister. Miss Snyder writes, "May 21, 1856, fourteen people then and there signed the covenant establishing a Baptist society in Chatfield." Keeping in mind the muddy roads of his day and the toiling of horses she adds later, "Dr. Trow was later read out of the society because of his persistent profanity. It just seemed like he could not keep from swearing at the critters." I recall a bout with the son "Met" when I was about 15 years old. My mother took me to see him when I had bumps over my shin bones. He gave me a dark liquid to paint on and, since there were no directions when to stop, I kept it up until I had developed over each shin area an excellent equivalent of army puttees. In due time these dropped off, leaving a nice pink skin and I am wondering whether we have any better treatment at this date for what was probably erythema nodosum. My mother retained the pioneer's thrifty ways of saving anything that might be useful and certainly that included any medicine. Some years later "Met", on fumbling through her medicine cabinet, took a look at this bottle of "puttee" fame, put it up to the light and with true deference to his father's training said, "that's the best G— d— iodine I ever saw. They don't make it that good any more." My excuse for putting this in is to add the personal touch without which historical narrative becomes encyclopedic and dull. In fact, I have borrowed the technique of Mrs. Guthrey because in one of her delightful passages she mentions an early doctor of the period of the War of the States and the threat of smallpox. He abjured his readers as a method of defense to strictly avoid whiskey and the democratic party—splendid advice even today.

I have reserved for the last, reference to one of the best possible methods of writing medical history; and to the charming book just at hand from the vivid and facile pen of Dr. Jay Arthur Myers—"Invited and Conquered." * This is a book which you *must read* and keep at hand for reference. While Dr. Myers has been too lavish in his praise of some who figured in the antituberculosis campaign, he has been all too sparing in outlining his own great deeds. He has supplied a compendium of "Who has been whom" in our midst. Together with his able co-workers he has presented what really is a great review of Minnesota medicine.

The field lies open for many such historical sagas. The growth of our hospitals (lay and religious); the life of men such as the late Charles N. Hewitt, our first great prototype of the Pasteur school; the evolution of roads and how they have put doctors into concentrated areas in close association with clinics and hospitals—in fact, the implementing of the basic resources of our state (soil, timber, iron mines, and an indomitable citizenry) into the great American surge of mass production. We are in it up to the roots of our hair; farms are getting larger and fewer men can work them, as horses give way to tractors; wingless chickens and hybrid cows with selected pigs fed on hybrid corn, the farmer is more of a geneticist than the doctor. Our aging population gravitate into the larger cities and become geriatric problems. You may ask me why I have avoided naming many of our great figures in medicine in Minnesota. Well, there are two reasons: in the first place, I am giving you the references where you will find what you *should* read; and secondly the only heroic historical figure so far successfully battling the age is Paul Bunyan.

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*Transfer names and a few items of dates and local landmarks and the story covers that of a thousand such foundings in this mid-continent empire.

*It is the story of a health resort state giving free hand access of men and cattle to the invading tubercle bacillus; the slow tedious fight to contain this great modern plague. Most of the figures I have quoted are from this enlightening book.

Suggestions for Reading

The volumes of Minnesota Medicine, historical articles mentioned in the text, especially 1930 to date.

And these books for background:

The Voyageurs, by Grace Nute, Appleton-Century, 1931.

Early Candlelight, by Maude H. Lovelace, University of Minnesota Press, re-issued 1949.

The Seven Iron Men (Story of the Iron Range), by Paul DeKruif, Harcourt-Brace & Co., 1929.

The Doctors Mayo, by H. B. Clapesattle, University of Minnesota Press, 1941.

Invited and Conquered, by Jay A. Myers, Webb Publishing Co., St. Paul, 1949.

The Chosen Valley, Margaret Snyder, Norton, 1948.

The Irish, Sean O'Faolain, Devin-Adair, 1949.

Reprinted from
1870

CHRONIC CATARRH

Catarrh, or more definitely, post-nasal catarrh, is the most common affection of this climate. It prevails extensively in this as well as all other Northern states, and the public mind having of late been much called to it, we constantly hear the remark that it is so much more frequent now than in years past.

It affects all ages, and when once established, is annoying during all seasons.

The cause can readily be found in the sudden and extreme changes of temperature to which we are subjected in winter, and the general introduction of coal and air-tight stoves is the reason why the disease is so much more common than it was thirty or forty years ago. To pass from a room, heated by a furnace to a temperature of 70 degrees, into the open air at zero, or below; or to step from a close, highly heated railroad car upon an exposed platform, where the cold, piercing wind chills you through, must do injury to the delicate mucous membrane of the nose and throat.

As developed, that injury, in the majority of cases, becomes *catarrh.* Often we have at once all the symptoms of an active inflammation, viz.: a chilly sensation, followed by fever, aching of the limbs and back; pain over the eyes; a sense of stuffing in the ears, and dryness in the nose and throat. After twenty-four or more hours, there is generally a free effusion of serum; the nose runs freely, and the extremity of suffering is relieved. Often, however, before this takes place, there has been an extension of the inflammation along the eustachian tubes to the internal ear, and violent catarrh is set up there. This frequently ends in suppuration, and rupture of the membrane tympani. . . . . .

Treatment. Should a case of catarrh be seen in the forming stage, it is possible to cut it short by rest, warmth, and the proper use of opium. The patient must remain quiet in a warm room, use a hot foot-bath, and at bed-time take a teaspoonful of paregoric, a quarter of a grain of morphia, or ten grains of Dovers powder. It is worse than useless to use any kind of snuff or wash in this stage. In twenty-four hours he will usually be free from his catarrh, but with such remaining sensibility that exposure may readily start another. He should therefore remain comparatively quiet for a few days longer.

D. W. Hand, M.D.: Chronic Catarrh.
Northwestern Medical and Surgical Journal 1:1, 1870

A Brief Sketch of North Dakota Medicine

F. L. Wicks, M.D.
Valley City, North Dakota

BECAUSE of the limitations of this article only a few of the many rugged individuals who toiled successfully for our profession in North Dakota can be mentioned. However much this is to be regretted, those active today can be left in hands of later historians.

The first individual engaged in medical practice in Dakota Territory, of which our state was then a part, was Dr. William Jayne of Springfield, Illinois, who was appointed by President Abraham Lincoln as the first governor of the territory.

The original pioneer physician of our part of the West was the army doctor and the first to come here for duty was Dr. W. D. Dibbs. He, and others in like capacity, came with the troops as escorts to civilians who sought livelihood and adventure because of the finding of gold in Montana and Idaho in the early sixties. Dr. J. S. Weiser, an army physician, was one of those who met a tragic death from Indian gunfire.

It was, however, at a later period when the railroads pushed through, bringing settlers into the territory in great numbers that the doctors arrived to stay. For the most part these early doctors were self-reliant, courageous, versatile, men of integrity. Many of them had splendid cultural educations as well as professional degrees. Some became pharmacists, some publishers, others came to hold high political offices and of course many engaged in ranching or farming or entered business.

GROWTH OF THE MEDICAL SOCIETIES

Even in territorial days boards of health had been created to protect the health of its citizens and these boards had much to do with the granting of licenses to those who wished to practice as doctors.

The first settlements, of course, were most numerous along the railways—the Northern Pacific and the Great Northern—and in the Red River valley. So it came about that the first medical society was formed in the locality of Fargo, followed by societies at Grand Forks, Northwood, Valley City and New Rockford, and in still other cities as settlement swept to the west.

Some medical organization had taken place in territorial days for the Golden Jubilee meeting for the Dakotas was held in Aberdeen, South Dakota, in 1931. Dr. A. Carr was our North Dakota president.

Perhaps first agitation for a North Dakota state medical association came as a result of several get-together meetings in the Grand Forks-Larimore area. For, said these men, "the profession must organize if it is to progress" and "we have now fully one hundred doctors in the state and we can have good meetings."

A draft of a constitution and by-laws was made following a meeting in Grand Forks in 1888. At a subsequent meeting in Larimore, May 22, 1889, with about twenty-five doctors in attendance, this draft was adopted, officers were elected, and thus the state medical association was born.

According to the early records of the army doctors in the territory, the chief conditions they were called to treat were scurvy, fractures, gunshot wounds, accidental trauma and tonsillitis "when the thaws came." In contrast to this regime consider the program presented at the Jamestown meeting (the second annual meeting) in 1890 when over fifty members were in attendance:

The President's Address
Progressive Medicine
Practical Points for the Country Surgeon
The Status of Feeble Minded and Imbecile Children of North Dakota
Paranoia
The Country Midwife
Puerperal Septicemia
A Laparotomy
Fracture of the Skull
The New Hypnotics
Mastoid Disease

Dr. J. G. Millspaugh had been elected president of the early, informal meeting and was re-elected to the same office for the following two years. A complete list of Association presidents follows, together with dates and places of the annual meetings:

Year	*President*	*Place*
1887		Larimore
1887-8	J. G. Millspaugh	Grand Forks
1888-9	J. G. Millspaugh	Larimore
1889-0	J. G. Millspaugh	Jamestown
1890-1	Henry W. Coe	Fargo
1891-2	W. C. Shurlock	Grand Forks
1892-3	A. P. Rounsevell	Jamestown
1893-4	I. N. Wear	Valley City
1894-5	A. B. Herrick	Fargo
1895-6	H. M. Wheeler	Wahpeton
1896-7	J. P. Aylen	Grand Forks
1897-8	Aug. Eggers	Jamestown
1898-9	F. R. Smythe	Fargo
1899-0	Geo. F. Bates	Grand Forks
1900-1	H. J. Rowe	Fargo
1901-2	H. D. Quarry	Grand Forks
1902-3	G. A. Carpenter	Bismarck
1903-4	W. H. Bodenstab	Fargo
1904-5	J. A. Rankin	Grand Forks
1905-6	Paul Sorkness	Fargo
1906-7	R. D. Campbell	Minot
1907-8	Chas. MacLachlan	Grand Forks
1908-9	H. A. Beaudeaux	Fargo
1909-0	J. E. Countryman	Grand Forks
1910-1	H. H. Healy	Fargo
1911-2	C. E. Spicer	Valley City
1912-3	A. J. McCannel	Minot
1913-4	M. MacGregor	Grand Forks
1914-5	R. H. Beek	Bismarck
1915-6	V. H. Stickney	Devils Lake
1916-7	V. J. LaRose	New Rockford
1917-8	G. M. Williamson	Fargo
1918-9	E. A. Pray	Grand Forks
1919-0	W. P. Baldwin	Minot
1920-1	Fred Ewing	Fargo
1921-2	H. E. French	Jamestown
1922-3	E. P. Quain	Grand Forks
1923-4	James Grassick	Bismarck

1924-5	W. C. Fawcett	Fargo
1925-6	John H. Rindlaub	Minot
1926-7	N. O. Ramstad	Grand Forks
1927-8	Thomas Mulligan	Devils Lake
1928-9	W. F. Sihler	Fargo
1929-0	John Crawford	Bismarck
1930-1	Andrew Carr	Aberdeen, S. D.
1931-2	Henry M. Waldren, Sr.	Grand Forks
1932-3	Paul H. Burton	Valley City
1933-4	Jesse W. Bowen	Fargo
1934-5	C. E. Stackhouse	Minot
1935-6	A. D. McCannel	Jamestown
1936-7	W. A. Gerrish	Grand Forks
1937-8	E. L. Goss	Bismarck
1938-9	W. H. Long	Fargo
1939-0	H. A. Brandes	Minot
1940-1	C. J. Glaspel	Grand Forks
1941-2	F. W. Fergusson	Jamestown
1942-3	A. R. Sorenson	Bismarck
1943-4	Frank I. Darrow	Fargo
1944-5	F. L. Wicks	Valley City
1945-6	James F. Hanna	Bismarck
1946-7	A. E. Spear	Fargo
1947-8	Philip G. Arzt	Jamestown
1948-9	W. A. Liebeler	Minot
1949-0	W. A. Wright	

Secretaries of the Association, perhaps because of the nature of their office, have served for longer periods. Dr. J. Montgomery was the first secretary, in 1887, followed by J. E. Engstad, 1888; C. D. Conkey, 1889; George McIntyre, 1890; George E. Jackson, 1891; D. E. Moore, 1892; G. A. Carpenter, 1893; R. D. Campbell, 1897; Paul Sorkness, 1900; E. C. Branch, 1901; C. L. Brimi, 1903; E. C. Wheeler, 1904; H. J. Rowe, 1905; A. J. McCannel; J. G. Lamont, 1926; Charles MacLachlan, 1929; A. W. Skelsey, 1930; L. W. Larson, 1940; and O. A. Sedlak, 1947 to date.

The first treasurer, was also Dr. J. Montgomery, in 1887, followed by A. P. Rounsevell in 1888; George McLain, 1891; J. A. Rankin, 1893; W. H. Phillip, 1902; J. D. Taylor, 1905; Frank J. King, 1910; C. S. Crane, 1913; W. F. Sihler, 1917; J. P. Aylen, 1920; W. W. Wood, 1922; E. J. Larson, 1947 to date.

This was the era of the small town physician, working more or less alone in isolated communities. Moved by a desire to share information and experience, and a fraternal urge to meet with their fellow physicians, here and there these doctors formed small medical groups, which in time became the component societies and counselor districts of the state organization.

At the present time the association is composed of 12 component societies, with representation by elected delegates to the house of delegates, now presided over by a speaker. Ten councilor districts give representation in the council. The society has the usual officers, 17 standing committees, 5 special committees besides local groups which handle the details in the place of annual meeting. For the past several years the society has profited from employment of Attorney E. F. Engebretson, as executive secretary.

Through the years our organization has had strong and forceful representation in the house of delegates of the American Medical Association.

Our society also is aided, supported, benefitted and complemented through the formation of the Woman's Auxiliary, which was organized in 1947.

At the last annual meeting of the Association, a number of men who have practiced medicine in North Dakota for the preceding half-century were elected to membership in the Fifty-Year Club. Noteworthy is the fact that several of these pioneers, who according to the calendar might have retired some time ago, are still in active practice today.

Public Health

The territorial legislature of 1885 had provided for territorial and county boards of health and in conformity thereto, Dr. E. M. Darrow of Fargo was appointed first superintendent of health for North Dakota. Each territory had its own superintendent of health and these men with their assistants constituted the examining body for those wishing to enter practice. Our present department of health is a direct descendant of the territorial board, with its powers and duties defined by the revised codes of 1905. In 1907 a bureau of vital statistics was added.

Up to 1921 the superintendent of health had but a very meager salary and budget with which to work. When Dr. H. E. French, in later years dean of the medical department of our university, took over the health office he campaigned vigorously for a full-time health officer who would correlate all public health agencies. This work resulted in the enactment of a law in 1923 creating a state department of health and a public health advisory council, and since that time the growth and usefulness of the department has kept pace with the progress of medicine. One provision of law stipulated that the health officer was to be a physician and that he have adequate training in public health.

At the legislative session of 1907 our profession was fortunate in having one of its members in the senate—Dr. J. D. Taylor, of Grand Forks. It was he who sponsored the vital statistics act and also one for the creation of a public health laboratory to be established at the university and to be placed under competent management. Both measures passed and through the years since then the laboratory has been of greatest aid to our practitioners of medicine.

At one time, for instance, the laboratory furnished information to the Federal Public Health Association regarding the isolation of the bacillus anthracis from Japanese shaving brushes found here in North Dakota. Later a national embargo was placed on these brushes. Another great benefit to our people resulted from the blood plasma program first started in 1944.

Medical Examining Boards

It has been mentioned that previous to statehood the licensing of doctors was one of the duties of the superintendent of health and his assistants. As early as the first year of organized medicine (1889) a meeting was called by the state medical association to plan a bill for this specific purpose. This bill, which became law, provided for the appointment of board members by the governor. This procedure was followed until a later law directed the appointment of members by the governor, but from those men recommended by the association.

At their midyear meeting in 1907, the board adopted a resolution placing the minimum educational requirement for admission to the medical examination the same as required by the university for admission to its medical school, namely two years of college work. The length of the medical course was to be four years. These requirements placed North Dakota with the top leaders of our states so far as preliminary education was concerned.

The medical law of 1911 made requirements still more stringent by adding oral and practical features to the medical examination. Reciprocity was legalized as a means of registration. Those who while working under the "old" law worked hardest for the "new" law of 1911, were said to have been Dr. H. M. Wheeler, secretary of the board, Dr. Smyth of Bismarck, and Dr. Aylen of Fargo. Since those days our examining boards have fought for much and against much in the interests of medical safety. Of the board members, no one has been more valiant or hardworking than the secretary and executive officer for many years, George M. Williamson, M.D.

Other Health Organizations

We are fortunate in North Dakota in having a number of societies composed of both medical practitioners and members of the laity, which are active in health work and in the spreading of health education. Perhaps the first of these was the North Dakota Tuberculosis Association, which came into existence in 1909, with J. Grassick, M.D., as president and Fannie Dunn Quain, M.D., as secretary. Working closely with our committee on tuberculosis, this group has placed in the field the mobile x-ray unit which has treversed the state in screening activities.

Others to be commended for their work are the North Dakota Public Health Association, the Crippled Children's Society, the Cerebral Palsy Council, and like agencies.

Other societies whose members are specialists but whose programs are always open to colleagues are those on ophthalmology, obstetrics and gynecology and pediatrics.

The Governor's Health Planning Committee

In July 1944, Governor Moses called together representatives of many groups and from these individuals a committee was formed to study health conditions in our state. Hospital, professional, farm, labor and other groups were represented together with welfare agencies, the legislature and the health department. Mr. Haslerud, extension director of the state college, has been chairman of the committee since its inception.

This committee has sponsored bills for requirements for nursing and hospital licensure and has supported the expansion program of our medical school. It has made studies on rural health and has been able to recommend where new hospital beds should be provided.

Legislation for Health Care

Through the committee on medical economics, which had made a long study of many various plans, a bill was presented to the legislature, which would allow our state association to engage in the business of furnishing certain medical care on a prepayment basis. This bill was passed.

After much more work and study, schedules were perfected and the plan launched in Cass County. The plan is set up to provide care in cases of surgery, fractures and obstetrics. It has been a success and is spreading to the territory of other societies. This Physicians Service or Blue Shield plan can be associated with the Blue Cross plan and gives our people the same advantages as are given by the medical associations of other states.

The Veterans Medical Service Division

Such a division has been created within our association and is being found agreeable to those veterans who wish to be treated in their home towns and by their own doctors.

Emphasis has recently been put on the diabetic detection drive among the laity and it is hoped with much benefit.

University Medical Center

Legal status has been given to the Medical Center Advisory Council which will be advisory to the Board of Higher Education in its connection with the University Medical School. The state constitution was amended to allow a one mill levy on all taxable property within the state, to produce a fund for the medical center at the University of North Dakota.

Some new building is being done on the campus and it is in the mind of the council to enlarge the curriculum to provide nursing courses on collegiate basis, to provide for degree courses for medical technologists, and to study expansion of the present two-year to a four-year course in medicine. Doctors who have been members of the legislature have always given our association splendid support and our committee on legislation has approved all measures.

In Summary

The progress of medicine since territorial days has come about as a result of the sum total of activity of all practitioners.

Those who have been placed in office have had the unified support of their colleagues at all times and they would be among the last to claim particular credit.

North Dakota has adequate hospital beds, with a steady increase in their number. Telephones are everywhere. Our highways are rapidly being improved.

It is the desire and intention of our practitioners to furnish the very highest type of medical and surgical care to our citizens and our residents will receive just that kind of care provided that the work of doctors is not made to suffer through unnecessary regulation.

Reference

Grassick, J., M.D.: North Dakota Medicine Sketches and Abstracts. Published by North Dakota Medical Association, 1926.

Medicine in South Dakota—1870 to 1950

Will E. Donahoe, M.D.
Sioux Falls, South Dakota

Eighty years is a long period of service and surely something for us to meditate upon a little. That is what I have been doing since receiving the assignment to write a history of medicine in the state of South Dakota for the anniversary number of the Journal-Lancet. My mind wanders off—picturing the ambition and effort put forth by a few physicians when this publication was first started. I think every physician could gain much from a little meditation, reviewing the conditions under which it began, the type of practice carried on by the physicians of that day; what they meant to their communities; and the advances since made in medicine. Congratulations to the present editors for carrying on the Journal in the form in which we have known it throughout many years—but congratulations seem hardly sufficient or meaningful enough.

With the thought that such history had already been compiled, I was surprised to learn from the office of our state historian, as well as from the officers of our State Medical Association and other physicians, that no such material had ever been gathered and recorded. I wrote to four or five of the earlier practitioners in various areas of the state, such as Dr. Mayer, of Aberdeen, our State Secretary; Dr. Hare and Dr. Jackson, in the Black Hills area; Dr. Riggs, of Pierre; and Dr. Hohf, of Yankton, all of whom replied with a little of the medical lore of their section and expressed themselves strongly that now would be an opportune time to compile a medical history of our state. Because of their expressions I am going to continue the effort to gather all the information possible during the coming months, with the idea of compiling such a history. Most of the information will have to come from the early practitioners of medicine, and the earlier residents of various sections of the state. We are a young state, and every community still holds some of its earliest settlers, or their children, who should be able to convey something. If this can be carried out to a successful conclusion, the Journal-Lancet can receive full credit for giving us the idea and stimulus for such an endeavor. Therefore, at this time, general comment shall be made, pertaining to the medical care received by our people, and its progress and development. Statements shall be made which, it is hoped, will regale the memories of many physicians in our state to the point of criticism, correction, and addition, all of which shall make for more material from which to compile a correct and credible history of medicine in South Dakota.

In the anniversary issue of the Journal-Lancet, February, 1931, there was an excellent review of the minutes of the South Dakota State Medical Association. A most complete and interesting sketch was given by Dr. J. F. D. Cook, who had served for years as its secretary. To mention a few items brought out: The Dakotas came into corporate existence in 1860, as Dakota Territory, and in 1861 President Lincoln appointed the first governor, Dr. William Jayne, a practicing physician of Springfield, Illinois. South Dakota came to statehood in 1889—19 years after the Journal-Lancet had been started in St. Paul, Minnesota.

On June 3, 1882, physicians from the eastern part of the state met in Milbank, South Dakota, and organized the "Dakota Medical Association" for the purpose of appointing delegates to represent Dakota Territory at the meeting of the American Medical Association in St. Paul June 6, 1882. At a meeting in August, 1882, credentials of four physicians were presented from the Black Hills Medical Society, indicating that a society had already been formed in the Black Hills, and in 1887 the Aberdeen Medical Society affiliated with them. In 1888 the first scientific paper is recorded, "Surgery among the Sioux Indians." In 1897 the first attempt to legalize the practice of osteopathy was passed by Congress but the bill was not signed by the governor. In 1901 there was much ado about an epidemic of a pustular skin condition among the Indians and whites variously called "Cuban itch," "Puerto Rican itch," "measles" and "smallpox". It was finally diagnosed as smallpox and vaccination and quarantine regulations were established. In 1891 the society became incorporated as the South Dakota State Medical Society. In 1906 the Journal-Lancet became the official publication. As early as 1882 the meetings were concerned with regulating the practice of medicine through license, enacting public health measures, State Board of Health, etc.

Medical care in the state of South Dakota probably was similar to that of the other states in pioneer days. The Indians, who were here first, had their own medicine men in whom they probably had the same trust and confidence that we have today in our physicians. I imagine the period when the Indians were placed on reservations, taken out of their tepees and put in poorly constructed huts or shanties, was about the time that tuberculosis came to be associated with them. Physicians were provided later to administer care, hospitals were built and probably better living conditions and better care were afforded to them. As they were put in restraint and under control, legal misdemeanors brought many Indians to our jails, where close confinement for any length of time meant tuberculosis. It has been clearly established that Lewis and Clark were the first to come into the state, in 1804, but there is no record that any medicine men accompanied them. This is probably in contrast to the missionaries coming out of Mexico, usually accompanied by troops of soldiers and having a physician, undoubtedly, as a member of the party. Within a few years fur-trading posts were established.

It would seem that the early settlers coming in were, in a large way, able to care for themselves. Our pioneer mothers were most able and the forms and methods of treatment in vogue at the time could be administered by them. Herbs, poultices, and local applications made up much of the home treatment. One recollects fresh cow dung was not an uncommon poultice and urine was used for earaches and skin conditions. Later, benefits from these were considered to be due to the heat contained but later research is bringing out other reasons. What a headache green apples were to the mothers in those earlier days and what consternation was caused when they later became the cure for diarrhea. In all communities there was always a woman who became known as the neighborhood, or community, nurse and one to be sought out at the time of any sickness. She was not only sought after but she was always willing to go where there was any sickness and distress. Such neighborliness as was known then is almost unbelievable in this day. This same type of women became the midwives of a later day with the coming of the physicians. They were most capable and took great pride in the valiant service they gave to new mothers and their babies and families. No eight-hour duty then!

With the establishment of early settlements and the arrival of the soldiers came the physicians. The life of the physician in that day was unusually difficult. Dr. Jackson writes of the trials and tribulations of the doctor in the Hills who had that vast territory between him and the river to look after. Distance between physicians was great and transportation, necessarily, had to be by foot, horseback or team. With no means of communication it was equally difficult to obtain the services of a physician, necessitating travel on the part of the patient or his family. Even though the doctors carried a supply of medicines, many had to be obtained from the drugstore and the druggist contributed his share with willing service night and day. Physicians, in order to give better care, took over small homes to serve as hospitals. These later developed into fine institutions. One interesting item from a Pierre newspaper concerns itself with what was probably some of the first surgery done in the state. In 1880 a rancher, attending a party which became quite wild, received a bullet in his leg. The leg was amputated by two "doctors", who were at least good at prognosis because they were not sure that he would live, so they sent the patient off to Sioux City, Iowa, where he died three days later. It developed that the two "doctors" were the local druggist and barber!

Some comment shall be made as it had to do with my own section. My parents had settled here in 1876 and I always heard much of the medical lore (and gore) of the early days. I remember going in the night for the doctor, his calling to me from out the window and then accompanying me back to my home. We had occasions to arouse the druggist in the night as well but I think these night calls were of emergency or dire necessity. In 1902 I contracted diphtheria myself, and was told something of its diagnosis and treatment. Dr. Schwartz, a young physician, coming from Iowa University about 1897, had brought the first antitoxin and our senior physician of today, Dr. T. J. Billion, who had just begun practice, had the first incubator and was able to culture the causative organism.

I began the practice of medicine in 1913, a time which, I think, was most auspicious because I saw the passing of the horse and buggy days and the coming of the automobile. The joke of the half century "get a horse" was meaningful then. Most small communities had a physician, but with the coming of the motor car, when life was made a little easier, the people also obtained cars and would drive to the larger community for their services. With such loss of practice the physician likewise, had to go in many instances, to the larger communities.

I heard much of previous typhoid epidemics and typhoid was not uncommon at this time. As I look back in connection with these two diseases, I recall particularly, in filling out insurance forms you would frequently get the family story of from several to eight or ten brothers and sisters having succumbed to typhoid or diphtheria. How seldom we hear that now. How seldom, too, we record families even that size! Aside from antitoxin for diphtheria, vaccinations for smallpox, and mercury for syphilis, there were few specific medications. Patent medicines had a great play and every fall drug store windows were full of red flannel-lined leather chest protectors to be worn foı the prevention of colds and pneumonia. Asafetida was still being worn about the necks of children for the prevention of colds.

In 1913 Sioux Falls had a poulation of about 15,000 people with about 28 physicians, the old, little, frame, two-story hospital and a small, modern one which had just been opened. In 1870, when the JOURNAL-LANCET was started, Sioux Falls had two physicians, one of whom did not practice, but came here with the town site company. In 1864 he had been appointed justice of the peace by the governor of Minnesota, as this part of the Dakota Territory was then part of Minnesota.

In 1907 the state university added a two-year medical course, which has since enjoyed an enviable reputation. Its students have always ranked high in the classes to which they went to complete their medical course. The state early established a hospital for the insane at Yankton; a school for subnormal or feeble-minded children, as it was called, at Redfield; a school for the deaf and mute at Sioux Falls; a school for the blind at Gary; and a hospital for the care of tuberculosis at Sanator. The federal government, for a number of years, had a hospital for insane Indians (and I think the only one in the United States) at Canton. At present, a large hospital for Indians with tuberculosis is located at Rapid City. The federal government has also established hospitals for the care of veterans at Sturgis, Hot Springs, and Sioux Falls.

Schools of nursing have been carried on in a creditable fashion in the larger hospitals of the state. One cannot speak of medicine in South Dakota without referring also to two large, non-medical clinics at Canistota and Marion. About the turn of the century two farmers had attained a reputation as bone setters. They built up office accommodations and, in recent years, have cared for as many as 1100 patients a day. Earlier, there was a Father Kruger who gained quite a wide reputation as a diagnostician and physician and he built up a large institution in Epiphany, South Dakota. Special trains, buses and wagons had to be run to carry people to and from his place. For many years after he discontinued this practice, relatives supplied the mail order requests for pills and medicine.

The depression days of the dust bowl area should certainly be recounted in any review of medical practice in South Dakota. This was a time when the federal government had to come in to insure some sort of medical attention to the farmers and the larger communities were hard put to furnish proper care to their people. The physicians suffered economically during these days. Savings and investments dwindled, and insurance, in many instances, was lost. Resources were sometimes so low that house calls could not be made unless gas was furnished for the car. Many successful physicians were reduced to dire want.

The population of the state had never exceeded that of the Twin Cities. Now, since the war, and the return of better living conditions, and the development of local institutions, South Dakota is seeing a return of well-trained physicians. The larger cities have had them, but with the development of community hospitals, many are locating in smaller communities. The physicians of the state have always been of high caliber, well-trained, and have kept abreast of medical advances, and have tried to serve their people well.

In the early days the physician was one of the few men of learning, and he was outstanding, not only as the family doctor, but as the family adviser as well, and a leader in community affairs. At the present time, we see the physician returning to the smaller communities trained and well equipped to give general and complete medical care to the family, and the general welfare and sanitation will, in every instance, be bettered.

Reprinted from
1870

AMYL NITRATE FOR ANGINA PECTORIS

Death of Sir James Y. Simpson.—It is with profound grief that the pleasure of seeing our new enterprise fairly commenced, is marred by the fact that we are called upon to record in its first issue the death of one of the greatest and noblest men our profession has ever possessed.

We learn from our foreign exchanges, that although first prostrated by his old enemy, rheumatism, great hopes were entertained of his recovery until he was seized with "anginiform symptoms," (*Angina Pectoris*). Apropos to the cause of his death comes the remembrance of an incident happening when we were enjoying the hospitality of his house some two years since. The subject of new anæsthetics having been introduced while at table, Sir James spoke of the nitrate of ammyl, and some interesting experiments he was trying with it. Calling for a sheet of blotting paper, he twisted it into a cone, folding down the apex; he then poured from a small vial a couple of drops of the nitrate into the cone and passed it to a young clergyman who, having chanced to call with some ladies a few minutes before, was sitting at his right hand. The clergyman was naturally very florid, with hair of the brightest auburn. The merriment of all the guests can easily be imagined, for upon removal of the cone after a few respirations, his face naturally bright, was now of the intensest red, even to the roots of the hair, and the gentleman himself entirely unconscious of the cause of our laughter, until catching a glimpse of his face in the mirror, he showed his appreciative power by joining us heartily. We all then tried it in succession, each new experiment causing a renewal of the mirth. Sir James then briefly explained the physiology of its action, and remarked that in it he expected to find "a specific for that troublesome affection, *Angina Pectoris*."

Northwestern Medical and Surgical Journal 1:17, 1870

Wisconsin Medicine in Retrospect

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Madison, Wisconsin

For thousands of years medicine was dispensed by the Indian medicine man in the forests of what is now Wisconsin. Up to the 1870s even frontier people would occasionally resort to his services. The only white doctors in the region, previous to large scale white settlement which occurred only after the Black Hawk War of 1832, were the regimental surgeons of the successive French, English and American army installations.

It is an historical paradox that one of the most outstanding events in Wisconsin medical history falls into this early period. In 1829-30 *William Beaumont*, who was stationed in 1826-28 at Fort Howard (Green Bay) and in 1828-32 at Fort Crawford (Prairie du Chien), performed a series of 56 experiments upon Alexis St. Martin, the Canadian trapper with the stomach fistula. It is well known that Beaumont's experiments represent one of the milestones of gastric physiology, and one of the most famous medical contributions of the United States. Among the early Wisconsin physicians another scientist of international reputation is to be remembered: the ornithologist Philo R. Hoy, born in Ohio in 1816, who came to Racine in 1846 and practiced there until his death in 1893.

When in the 1830's immigration into Wisconsin became a mass phenomenon, numerous medical men entered the state. As a matter of fact the ratio of physicians to general population then probably reached an all-time high. By 1846, for instance, no less than 32 physicians had come within a decade to Milwaukee which had a population of 10,000 in 1846. Small wonder then that many of these early practitioners had to abandon their profession in favor of business or politics. Others moved on west, or died young. Proficiency in hunting was an asset to the pioneer physician as in the case of Danish-born and trained Christian Linde (Oshkosh 1842-87) who thus gained the respect and confidence of the Indians to the point where they submitted to vaccination from his hands.

The usefulness of the frontier physician, his inventiveness and wisdom, his heroism, the hardships he suffered have been described so often that further elaboration of these positive and romantic aspects seems unnecessary. That the frontier attracted also quite a number of unscrupulous and ignorant individuals, is suggested by complaints in early medical society proceedings. That strange therapeutic procedures were cultivated even by the best, is evidenced by the application of a split puppy to a fistula of the epigastrium by a prominent Milwaukee doctor in 1848.

Most of the early doctors, like most of the early settlers, were Yankees, that is native Americans from New England or New York state, with a generous sprinkling of men from the British islands. In the forties Scandinavian and especially German doctors appeared in quantities. Probably no more than one fifth of the medical practitioners of the period were graduates of medical schools. To what extent the prominence of the school graduates and native-born in the surviving records (mostly medical society records) reflects actual medical superiority, or to what extent this fact is due to the political abilities of this group is hard to judge.

One of the finest representatives of this early generation of Wisconsin physicians was *Erastus B. Wolcott*. Born in 1804 in western New York, he settled in 1839 in Milwaukee (population then 700). He was surgeon general of the state from 1842 to his death in 1880 and rendered signal service during the Civil War. The most famous of his many surgical accomplishments is the removal of a tumorous kidney in 1861, the first nephrectomy on record. In 1869, Dr. Wolcott married Laura Ross, one of the earliest women physicians of the state. The earliest was probably Mrs. Grace McPherson Grant (1807-1883) who settled in Ottawa in 1842.

It is consistent that in this frontier and Civil War situation, at a time shortly after the discovery of anesthesia and antisepsis that Wisconsin's early physicians should be most proficient in the field of surgery. German-born Ferdinand Rosenthal of Milwaukee and Newfoundland-born J. Coldy (Watertown 1846-94) used in 1848 and 1866 respectively what might well be described as aseptic methods. E. L. Griffin from New Hampshire (Fond du Lac 1855-92) did the first cesarean in Wisconsin in 1872. "Listerism" was propagated in the state society as early as 1869 by the Milwaukee surgeon Solon Marks. The greatest figure of what might be called Wisconsin's second medical generation, *Nicholas Senn*, was again a surgeon. Born in Switzerland in 1844, he came with his parents in 1852 to Ashford, Wisconsin. He practiced in Ashford from 1868 to 1873, in Milwaukee from 1873 to 1893. In 1893 he moved to Chicago where he died in 1908. Senn was primarily a plastic surgeon. He made a fine record in the Spanish-American War, and was a prolific writer and great traveler.

Wisconsin suffered from the cholera epidemics of 1832 and 1849. It was visited by smallpox in the 1840s, 70s and 90s. Malaria was quite frequent in the beginning but disappeared spontaneously with frontier conditions in the 1870s. Typhoid, diphtheria, and tuberculosis took still a very heavy toll at the end of the century. This pathology made Wisconsin's early physicians public health conscious. Their demands for a permanent state board of health was fulfilled eventually in 1876. The enthusiasm of the early LaFollette area of Progressivism and the abilities of state health officer Cornelius Harper (in office 1902-48) caused Wisconsin to father a number of pioneer institutions in public health in the first quarter of the 20th century, such as the State Laboratory of Hygiene in 1903 and the Wisconsin Psychiatric Institute in 1915. An active state-supported antituberculosis campaign started in 1901, promoted through the years especially by Dr. H. E. Dearholt and Dr. Rock Slyster. (Dr. Rock Slyster was A.M.A. president in 1939, the only Wisconsin man to hold this office.) It is probably due to this general enthusiastic atmosphere that the Wisconsin State Medical Society went on record in 1916 as favoring compulsory health insurance.

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The situation of the insane became untenable in the 1850s with hundreds of mental patients being jailed, and the first asylum for these patients was opened near Madison in 1860 and a second on Lake Winnebago in 1873. Director of the latter was Walter Kempster, an international authority in neuropathology.

Fielding H. Garrison has rightly stated that "the medical history of these (that is Midwestern) states is largely a history of medical education and legislation, including the formation of schools and the foundation of societies." The role of the medical society in this type of environment was tremendous: it had to create professional standards in a chaos of practitioners of all descriptions, maintain cohesion and cooperation among men addicted rather to rugged individualism and competition, disseminate medical knowledge, and advise the legislature in the direction of sound health and educational laws.

The Wisconsin State Medical Society derives directly from a thirteen-man Territorial Medical Society, incorporated in 1841. To attend the annual meetings was no mean task in pre-railroad days. For instance, for Dr. Harmon van Dusen (born 1803 in Connecticut, Mineral Point 1847-85) one of the most faithful and disinterested promoters of the State Society, it always meant two three-day trips with a buggy. In 1848, the year when the society became the State Medical Society, delegates from district and county societies were noticed. The progress of the society was slow (48 members in 1855 out of several hundred doctors in the state) and no meeting could be held from 1861 to 1867. After a reorganization in 1868 under van Dusen the society has developed strongly and steadily. It sponsored a good many useful laws and institutions. Women doctors were admitted in 1885. Up to the 1870s it was almost obsessed with the danger of homeopathy. Since the early 30s the society has become increasingly absorbed by the problem of so-called "socialized medicine." Much of its activity in this direction has been executed by the lay secretaries that the society has had since 1923. Wisconsin has now over 3500 doctors, and ranks among the three healthiest states of the Union.

Since the 1880s Wisconsin doctors tended more and more to be Wisconsin-born—another sign that the frontier period was over. Yet for quite a while most of them had still to leave the state to obtain their medical education. It may be partly due to the educational situation that Wisconsin that prides itself as the birthplace of such men as F. G. Benedict, Frank Billings, W. B. Cannon, H. B. Favill, L. Hektoen, J. B. Murphy, A. J. Ochsner, E. C. Rosenow, B. W. Sippy, and G. Weaver, lost these and other able medical sons to the great medical centers of the East. It was not until 1893 that the first medical school, the Wisconsin College of Physicians and Surgeons, was founded in Milwaukee, and only through fusion with another Milwaukee school and affiliation with Marquette University in 1907 did the Milwaukee school obtain its present standing. From 1920 to 1947 Marquette Medical School enjoyed the leadership of Dean Eben J. Carey, equally outstanding as an anatomist and an administrator.

Medical education in the University of Wisconsin developed very slowly. Premedical biological courses were instituted in 1887. In 1907 the medical school opened, but due to the lack of clinical facilities it could give only the first two years of the course. The creation of clinical facilities (in the form of Student Health Service, opened in 1910, and the State of Wisconsin Hospital) was violently opposed by some members of the profession as "socialized medicine." Only in 1925 were these obstacles overcome to the extent that a full course could be offered. One of the features of the new school, the preceptorial system, has received nationwide attention. The strength of the school have been its science departments, almost twice the age of the clinical ones. Outstanding scientists like Ch. R. Bardeen, the first dean of the school, W. Snow Miller, A. S. Loevenhart, to mention only those deceased, have served for decades on its staff. Biochemical work, especially on vitamins, done in the University by men like E. McCollum, E. B. Hart, H. Steenbock, C. Elvejhem and K. P. Link, has been of great impact to American medicine as a whole.

Of great importance for the maintenance of medical standards in Wisconsin were the legalization of dissection in 1868, the establishment of a State Board of Medical Examiners in 1897, and the promulgation of the basic science law, in 1925, a procedure that was followed in many other states.

The first hospital in the state was apparently St. Mary's in Milwaukee, opened in 1848; and the first school for nurses—the Wisconsin Training School of Milwaukee, opened in 1888. The founding of an Eye and Ear Infirmary in Milwaukee in 1870 announced the coming of specialism to Wisconsin. Most of the 226 hospitals and sanitaria in the state, which has the same hospital bed-population ratio as New York, have grown up in the 20th century. In the same period the well known midwestern tendency towards group clinics, growing often out of the partnership of physicians related by blood, has been manifest in many of the cities of the state.

Wisconsin medicine has followed the general pattern of American medicine in general, and of its midwestern neighbors in particular. It has had its frontier period with a well developed surgery, and it has increasingly contributed to the medical sciences in the 20th century. Its most specific contributions so far have been probably such departures in "state medicine" as were made under the general influence of the "Wisconsin idea" in the first quarter of the 20th century.

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Reprinted from
1870

TRANSACTIONS OF THE WISCONSIN STATE MEDICAL SOCIETY
MILWAUKEE, MORNING SESSION, JUNE 22, 1871

Society convened pursuant to adjournment and was called to order by President Strong at 8:30 A.M.

Before proceeding to regular business, Dr. Marks brought before the Society an interesting case of carious disease of the bones about the ankle-joint in a young man, the result of a sprain received several years since.

The minutes of last evening's session were read by the Secretary and approved.

Dr. Stone, delegate from the Minnesota State Medical Society, was then introduced to the convention and briefly but happily addressed it, conveying the greetings of his State Society, and expressing the hope that there might in the future be more close and fraternal relations between the two associations.

The Board of Censors made a report recommending for membership:

Dr. J. B. Woodruff, of Fox Lake, graduate of Berkshire Medical College, Pittsfield, 1848; Dr. G. F. Hunt, of West Bend, graduate of University of New York, 1856; Dr. N. Monroe Dodson, of Berlin, graduate of University of Iowa, 1857.

On motion the recommendation of the Censors was adopted, and the above named gentlemen were admitted to membership. . . . . .

The report of the standing committees being called for, Dr. Marks, Chairman of the Committee on Surgery, read a paper on the treatment of fractures, based on cases which had passed under his observation during the past year. Following this report and suggested by it, there arose a somewhat animated discussion of the uses of Carbolic Acid in the treatment of wounds, which was participated in by Drs. Meachem, Van Norstrand, Witter, Martin, Brown, Waterhouse and Reynolds.

Some of these members had been in the habit of using it in varying proportions, to wounds of all classes,—others had used it only in cases where the appearance of the tissues was unhealthy.

At this point Dr. Van Norstrand took the chair and Dr. Strong took the floor, announcing himself as a little old fogyish in this matter. Thinks granulations a necessary process in suppurating wounds, and when this process is proceeding in a healthy manner, believes that the application of Carbolic Acid is injurious,—thinks it sometimes retards the process, and aggravates the wound. Would use the acid where wounds were assuming an unhealthy appearance, but would not use it when there were healthy granulations.

Northwestern Medical and Surgical Journal 2, 1870

Pioneer Medicine in Manitoba

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The recorded history of that part of this continent now known as the province of Manitoba commenced in the most productive period of England's history, the days of Elizabeth, Shakespeare, Bacon, Raleigh, Drake and Harvey. In that day adventurous seamen dreamed of fame and discovery; princes and monarchs saw visions of vast possessions; speculators felt that fabulous wealth was just around the corner of the earth. Mystery and vague rumors fed the belief that an easy sea route—the Northwest Passage—could be found through or around this continent to the other side of the world and to untold opulence of mystical Cathay. This passage was not accomplished for over 200 years during which time fifty grueling attempts had failed. Most of the early discoveries in northern Canada and in the Hudson Bay were incidental to these futile efforts. In 1610 (one year after his discovery of the Hudson River), Hudson made his way into James Bay where he was abandoned in an open boat by his crew. In 1612 a searching expedition landed at the mouth of the Nelson River (York Factory). These were the first white men known to have come to what is now Manitoba. The first direct reference to a medical man to appear in the literature of this period is found in the record of Captain Thomas James who spent the winter of 1631 and 1632 on an island in James Bay. In his account of his preparation to set up winter quarters on shore he says: "Betimes in the morning I caused the chirurgeon to cut off my hair short and to shave away all the hair off my face, for it became intolerable, and because it would be frozen so great with icicles." [1] This was the first surgical operation known to have been undertaken in the Hudson Bay.

Soon it became apparent that these northern regions possessed enormous potential wealth in furs. The hope of easy wealth appealed to a group of "gentlemen adventurers" in London and in 1670, led by Prince Rupert, they formed the Hudson Bay Company and received a charter from Charles II. This company was given almost complete dominion over all that part of North America draining into the Hudson Bay. They built a number of "forts" or "factories" on the shores of James Bay and Hudson Bay through which they established a prosperous trade with Indians and Eskimos. They penetrated inland very slowly and none of their traders explored as far south as the Red River (the present site of Winnipeg) until 1800.

During this period of exploitation and exploration, little information of medical interest has come down to us. A "chirurgeon" was usually among the ship's company and often was second in command, but none remained in the country more than a few months. Their records are a catalogue of devastating scurvy, ship fever, starvation and incredible suffering from exposure. All this was met by the stubborn courage and stolid persistence of English seamen, the breed that put the Anglo-Saxon stamp on most of the first settlements of this continent.

The central part of the province—that is, the Red River Valley—was first discovered by La Verendrye in 1738. When the St. Lawrence River Basin was still a French colony, he made his way by canoe to Lake Winnipeg and thence up the Red River. This 1500-mile canoe route along the Ottawa River, Lake Michigan, Lake Superior, Rainy River, Lake of the Woods and Winnipeg River remained the channel of communication between the Red River Valley and the East until sternwheelers began to ply from the end of steel at Moorhead, Minnesota, over a hundred years later (1860). During this period a large and lucrative fur trade was built up along this route by French companies with headquarters in Montreal.

The first effort to found a permanent settlement came in 1812. The Earl of Selkirk, a Scottish peer and an idealist, aspired to the creation of American colonies to relieve the distress of Highland crofters. In order to further his plans he purchased a controlling interest in the Hudson Bay Company and from them received a large grant of land in the Red River valley which extended well down into what is now North Dakota and Minnesota. During three years he transported several hundred persons—tenant farmers and artisans with their families—to the region about the junction of the Red and Assiniboine rivers, now the site of Winnipeg. Possibly no other race but the hardy Scottish highlanders could have survived the rigors of that transplantation. The voyage through the Hudson Bay, even today with modern ships, is hazardous; the trip in crudely constructed row boats down the tortuous water course (Hayes River and Lake Winnipeg) through a rugged wilderness appears to us an incredible feat, especially when we consider that women and children were in the company. This small colony existed as a remote, isolated settlement for over fifty years. During this time they were twice driven out by hostile fur interests; had their settlement twice destroyed by floods (1826 and 1852); had thir crops consumed by plagues of grasshoppers on several occasions; were driven by acute food shortage to spend several winters in Pembina where pemmican could be purchased from the natives and Metis; were harassed by severe winters and epidemics. Contact with the outside world came once a year through the Hudson Bay and during the summer by fur traders from Montreal

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whose animosity to the colony frequently blazed into violence. The situation was alleviated only when more intimate contact was established with the new and rapidly growing centers up the river in North Dakota and Minnesota. Beginning about 1821 this trade route developed rapidly and at one time there were 1500 Red River carts on the trail between St. Paul and the Red River during the summer. Later the traffic was largly taken over by sternwheelers paddling north from Moorhead.

The first medical man known to have been stationed in the settlement was James White. The record tells us nothing except that he was murdered with twenty other settlers and another medical man by hostile fur traders in 1815. Occasional references are made to other pioneer doctors who visited or resided in the settlement. No doubt most of them were inspired by the spirit of adventure and the hope of wealth rather than any great interest in medicine. Their primitive training was that of the ships' surgeons and their capacities were rather those of hardy navigators than of physicians. This is well attested by the following extract from notes written in 1819:

> "About twelve o'clock p.m., in consequence of dreadful shouting, I went upon deck, and found every one in the greatest consternation and terror; it appeared we had got in among shoals, and that we had now not more than four fathom water; in a short time, however, we got into ten fathom, when we cast two anchors. On these depended all our safety; if they gave nothing would have saved us from being driven on shore, when we must inevitably have perished; fortunately, however, they held fast. About ten o'clock a.m., Mrs. McClain was, to the great joy of all on board, safely delivered of a daughter."[2]

The first record of any official interest in public health is in 1834 when the Donald Ross correspondence contains the note: "Dr. Bunn is beginning to vaccinate since hearing of your foresight and success at Norway House."[3]

The history of the colony until its incorporation as a province in 1870 is punctuated by a number of heroic episodes of dramatic rather than medical interest. One of the earliest and not the least of these was the coming of the Grey Nuns in 1844. Four devout young women volunteered from among the Sisters of Charity of Montreal to give their lives to the welfare of the far colony. Under the supervision of Hudson Bay employees the 1500-mile canoe trip was accomplished in two months, by the same route originally followed by La Verendrye. in 1847, "L'Hôpital Général de St. Boniface" opened its door to all those afflicted in mind, body or estate. This was not a hospital in the present sense of the word; it was the residence of the Sisters from which they dispensed home nursing services and gave shelter to the destitute. The record, among other things tells of vaccinating 3,232 people in 1870. The first building devoted entirely to the care of the sick was erected in 1871; this beginning has now increased to provide beds for over 1200 patients in three large institutions.

In 1870 the Hudson Bay rule was terminated when the province of Manitoba became a part of the Dominion of Canada. During the political storms incident to this change the few medical men in the community took a vigorous part. A medical act was among the first to pass the new legislature and the standards for practice have since then kept at a high level.

With the coming of the railway from Duluth via Moorhead, Minnesota, in 1878, the province entered into a "boom" and within ten years the population was well over 100,000. In 1881 the Canadian Pacific Railway connected Winnipeg with eastern Canada and in 1885 the line was completed from coast to coast. From that time all the old fur trade routes were abandoned and general development has paralleled that of the middle west states.

In 1883 the medical school was organized by the personal efforts and contributions of members of the medical profession who had come to the young province from the older parts of Canada. Teaching was on a voluntary basis until 1902 when the University undertook the pre-clinical subjects. In 1919 the college relinquished its private charter and became the Faculty of Medicine in the University of Manitoba. The course has been lengthened from time to time until now three pre-medical and five medical years are required. The final year is spent in residence in an approved hospital and the final examination is the licentiate examination by the Medical Council of Canada. From the original class of six graduates, the number has grown so that now about 65 are graduated each year. In all over 2000 have been graduated, the majority of whom have taken up practice in the province. A large number have gone to the western provinces, especially to Saskatchewan, where there is no medical school. Between 10 per cent and 15 per cent have emigrated to the United States, especially to Minnesota and the Dakotas. It is of interest to note that few graduates from American schools have at any time come to the prairie provinces to practice, though small numbers still come from eastern Canada and the old country.

Since the opening of the Medical School the history of medicine in the province has been the spread of its influence as settlement has penetrated to the more remote parts. Medical men are still pioneering at the periphery of expanding colonization. In contrast, in Winnipeg, where almost one half of the population is concentrated, all the amenities of modern medicine have developed. Hospitalization, public health activities, research and postgraduate activities are all progressing with the times. The structure of the medical world has become as complex as that of society itself and the history of its modern development would require much more space than is available here. In general, it has been very similar to what has taken place in the states of the middle west.

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The History of the Medical School of the University of Minnesota

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The story of the Medical School from its establishment in 1888-89 until September, 1910, is taken from documents in the custody of the Minnesota State Historical Society. The account of events from September, 1910, when I first joined the medical faculty, through 1949 is based upon my own observations and experience. I have tried to appraise the various men who have played important roles, in terms of their contributions to medical education and their influence on the medical school. It has been necessary at times to be unkind, but a historian must tell the truth as he sees it. During the past two-score years the Medical School has developed from a second-class teaching unit to one of the foremost research institutions of the country, and it is my task to show how this remarkable change has been brought about. The strength of a medical school is proportionate to the number of recognized leaders of medical thought on its faculty. Good teaching is necessary and not incompatible with investigation; but only research men make a university famous. The primary purpose of a medical school is to train young men and women to be competent physicians; but it has also the obligation to advance medical knowledge. A department which does not encourage investigative work soon stagnates, and even its teaching deteriorates. The Medical School took its first step forward in 1913 when Dr. Clarence M. Jackson was made professor of anatomy. Under Dr. Jackson's guidance the department of anatomy soon became the foremost in the country, and its prestige stimulated research in other divisions of the Medical School. From 1913 onward there has been continuous progress in most departments due to the appointment and promotion of outstanding men.

In 1888 three of the four medical schools in the Twin Cities offered their charters and their resources to the university to establish a medical school. This offer was accepted by the regents and for the next five years the Medical School occupied a small building near Asbury Hospital donated by the Minnesota Hospital College. Thereafter campus buildings were used as a hospital until the Elliott Hospital was completed in 1911. In March, 1908, the medical department of Hamline University was fused with the university, and since that time there has been only one medical school in the state.

The Institute of Pathology and Public Health was completed in 1906-7, the Anatomy Building and Millard Hall in 1912. The University Hospital was enlarged by the addition of the Todd Hospital, and in 1923 by the erection of the Cancer Institute. The Medical School occupies a part of the Medical Science Building in which the School of Dentistry is located. The funds are now available for the erection of the Mayo Memorial Building, and when this is constructed the Medical School will be provided with ample space. For many years the University has used the facilities of the Minneapolis General Hospital and the Ancker Hospital in St. Paul for clinical teaching, and these institutions have played an important role in the training of young physicians. The clinical and laboratory material at the Minneapolis Veterans' Hospital is now being utilized for teaching and research.

The Presidents and the Deans

The development of the Medical School has been greatly influenced by its deans and by the presidents of the university. Obviously when a major appointment must be made the executive officers have a great responsibility. President Cyrus Northrop, 1884-1911, was a successful administrator for the university when it was young and needed popular support, but toward the end of his administration it became apparent that he was a poor judge of scholarship and measured men by their social graces rather than by their scholarly attainments. The building program advanced during his administration, but otherwise there was no progress.

President George Vincent, 1911-1917, had the difficult task of changing the University of Minnesota from a college to a true university. He tried to bring in creative scholars to head the various departments. He exhibited great courage and was in a large measure successful. In the spring of 1913 the regents directed the reorganization of the Medical School. The advisory committee consisted of F. F. Wesbrook, Charles L. Greene, and J. E. Moore of the medical faculty and three loyal alumni, Drs. L. B. Wilson, Edward L. Tuohy and Theodore Bratrud. Dr. C. M. Jackson was recommended to head the department of anatomy and Dr. E. P. Lyon as head of physiology. Other changes were made, requiring great courage on the part of the president but it was the beginning of a new era for the Medical School.

Another major disturbance during the Vincent administration was brought about by the affiliation with the Mayo Clinic in 1915. President Vincent was strongly in favor of the affiliation. Although it affected only the graduate school directly, it was bitterly opposed by many of the clinical teachers, and some of them resigned from the faculty, notably Dr. Charles L. Greene, then head of internal medicine, and Dr. George Douglas Head. The resignation of Dr. Head was a serious loss to the medical school.

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*Former Director, Department of Pathology, University of Minnesota Medical School (retired, June 1949).

No important changes occurred during the administration of President Marion L. Burton, 1917-20; but we are indebted to him in that he prevented a group of faculty men supported by one prominent regent from forcing the resignation of Dean E. P. Lyon.

The Medical School made continuous progress during the administration of Lotus D. Coffman, 1920-1938. During the greater part of his long term in office, Coffman followed the sound advice of Dean Lyon and many good appointments were made, but on occasions he prevented the dean from making some desirable changes. On the whole his administration was excellent from the standpoint of the medical school.

The medical school has prospered during the administrations of Presidents Ford, Coffman and Morrill.

Dean Perry Millard (1888-97) and Dean Park Ritchie (1897-1906) appear to have been competent men who did a good job with the resources at their disposal. Dean Frank Wesbrook (1906-13) was a man of pleasing personality but he had little interest in scientific medicine. He actually discouraged research work. Dean E. P. Lyon (1913-31) was a Ph.D., and doubt was expressed at the time of his appointment that a non-medical man could be a successful dean of a medical school. But he had high ideals in education and his administration was on the whole successful. He believed in scholarship and research and made many good appointments.

Dean Richard Scammon served from 1931 to 1935. Dr. Scammon was a brilliant scientist and teacher, loved by all his students and colleagues; but his brilliant mind was not adapted to administrative work.

Dean Harold Diehl (1935-) was director of the Student Health Service when he was appointed as dean. The fourteen years of his administration have been highly successful. He has maintained high standards of teaching and research among the faculty. It is in large measure due to the untiring efforts and faith of Dean Diehl that we now have funds available for the Mayo Memorial Building.

THE SEVERAL DEPARTMENTS

Anatomy. The teaching in the Department of Anatomy was first put upon a full-time basis in 1908 with Dr. Thomas G. Lee as head of the department. Dr. Lee's chief contribution was the planning of the Anatomy Building which was completed in 1912. Prior to that time the department was housed in what is now called Wesbrook Hall and dissection was done in one of the campus houses. In 1913 Dr. Lee was replaced by Dr. C. M. Jackson. The period of Dr. Jackson's administration was the golden age of anatomy. Among the staff were J. B. Johnston, Richard Scammon, Hal Downey, A. T. Rasmussen and later E. A. Boyden. In 1940 Dr. Jackson retired because of illness and Dr. Boyden was made chairman. Under Dr. Boyden's guidance the department has maintained its prestige.

Physiology. Dr. R. O. Beard was head of the Department of Physiology from 1889 to 1913 when Dr. E. P. Lyon was made head of the department. During this period the department made little progress, but Dr. Fred Scott did good teaching. Under Dean Lyon's supervision the department did better teaching but was still relatively unproductive. In 1936 Dr. Maurice B. Visscher was made chief of the department and under his supervision it has become one of the leading research departments of the country.

Pharmacology. Pharmacology was separated from the Department of Physiology in 1911. In 1913 Dr. A. D. Hirschfelder was appointed chief. Upon Dr. Hirschfelder's death in 1942, Dr. Raymond Bieter was put in charge of the department. Dr. Harold Wright joined the staff in 1929 and now has the rank of associate professor.

Biochemistry. Biochemistry was established in the Department of Physiology in 1920 under the direction of Dr. J. F. McClendon who remained in charge of the course until his resignation in 1939. He was followed by Dr. George Burr. In 1946 Biochemistry was established as an independent department with Dr. Wallace Armstrong as head. Dr. Armstrong's contributions on fluorine analysis and dental caries are well known.

Pathology. Pathology and Bacteriology were established as one department in 1895-6 with Dr. Frank Wesbrook as head. Upon Dr. Wesbrook's resignation in 1913 Dr. Harold E. Robertson was placed in charge. Dr. Robertson joined the staff of the Mayo Clinic in 1920 and E. T. Bell was made head of the department. Dr. Robertson was a good teacher and it was he who organized the postmortem services in the Twin City area. He established cordial relations with the funeral directors which have persisted through the years. In the summer of 1919 the Department of Pathology was moved from the old Institute of Public Health into the Anatomy Building. Dr. James R. Dawson was made director of the department in June, 1949, following the retirement of Dr. Bell. Drs. B. J. Clawson and James S. McCartney have contributed substantially to the success of the department over the years. Dr. Robert Hebbel joined the staff in 1940.

Bacteriology. Bacteriology was separated from Pathology in 1913, with Dr. W. P. Larson as head. This department has had a long, successful career with several brilliant investigators on its staff, the foremost of which were Dr. Robert Green and Dr. A. T. Henrici. Upon Dr. Larson's death in January, 1947, Dr. Green was made director but his untimely death nine months later again left the chairmanship vacant. This department lost three very strong men in the course of a few years. The department has been under the able direction of Dr. Jerome T. Syverton since 1948.

Medicine. The Department of Internal Medicine was staffed by part-time teachers until 1916 when Dr. Leonard Rowntree was made chief of the department, the first major clinical appointment on a full-time basis. The part-time clinical staff carried all the teaching until 1916 and they still contribute generously of their time.

Among the foremost of our clinical teachers was Dr. S. Marx White, whose keen diagnostic abilities have impressed all his students and colleagues. Dr. Rowntree remained at Minnesota until 1920, when he joined the staff of the Mayo Clinic. Dr. S. Marx White was in charge of the department from the time of Dr. Rowntree's resignation until 1925, when Dr. Hilding Berglund was made chief of the department on a full-time basis. Dr. Berglund's career at Minnesota was stormy and in 1934 he was asked to resign. Dr. J. C. McKinley was chief of the department from 1934 to 1943, when Dr. Cecil J. Watson was made head. Dr. Hobart Reiman was a full-time member of the staff from 1930 to 1936. Dr. Cecil J. Watson took a Ph.D. degree in pathology after graduation from the medical school; was made an instructor in medicine in 1933; was promoted to a professorship in 1940; and in 1943 he was made chief of the department. His outstanding contributions have made him one of the leading men in internal medicine. The department did not really attain university stature until Dr. Watson assumed its leadership. Dr. Wesley Spink, a full-time professor, has added notably to the prestige of the department. Another important contributor to the fame of the department of medicine is Dr. J. A. Myers, who has attained national recognition by his work on the control of tuberculosis.

Neurology and Neuropsychiatry. Dr. Arthur Hamilton was a leader in his field during his long period of service, 1915 to 1934. Upon his retirement he was succeeded by Dr. J. C. McKinley, who had been with the department since 1921, and who directed it ably from 1934 until his retirement in 1945. The department was made independent of Medicine in 1943. Dr. A. B. Baker was made an instructor in 1934 and promoted to professor and chief of the Division of Neurology in 1947. Dr. Baker's contributions to the literature of neuropathology establish him as one of the leaders in this field. Dr. Donald W. Hastings was made head of the Department of Neurology and Neuropsychiatry in 1946.

Pediatrics. Pediatrics was a division of Medicine until 1913, when a separate department was established under the direction of Dr. J. P. Sedgwick. Dr. Sedgwick was on a full-time basis the last year or two of his life, but he was in ill health and could not accomplish much. He died in 1923, and Dr. Frederick Schlutz was head of the department until his resignation in 1930, when Dr. Irvine McQuarrie was made chief on a full-time basis. It now ranks among the foremost in the nation both in research and in teaching.

Surgery. The surgeons on the faculty in 1888 were Drs. Perry Millard, Charles A. Wheaton and F. A. Dunsmoor. There was no surgeon on full time in a major position until 1928. Dr. Perry Millard died February 2, 1897, and Dr. Parks Ritchie was installed as Dean and successor to Dr. Millard. Dr. Ritchie resigned in 1906 and Dr. James E. Moore was made chief of the Department of Surgery. After the resignation of Dr. Moore in 1917 Dr. A. C. Strachauer directed the department until 1930 when he was succeeded by Dr. Owen Wangensteen. Dr. Wangensteen was first associated with the department as instructor in 1926. He was promoted rapidly to a professorship and was made chief of the department in 1930. His work on intestinal obstruction had already won him international recognition. Much of the prestige the Medical School now enjoys is due to its department of surgery. Dr. William Peyton is occupied with neurosurgery and there are many competent younger men in the department.

Orthopedic surgery is a subdivision of the Department of Surgery. On its honor roll are the names of M. P. Vanderhorck, Arthur Gillette and Emil Geist. This efficient division is now under the guidance of Dr. Wallace Cole.

Ophthalmology and Otolaryngology. The Department of Ophthalmology and Otolaryngology was established in 1897 under the direction of Dr. Frank Todd. Dr. Todd died in 1918 and the department was in charge of Dr. William R. Murray from that time until his death in 1926. In 1927 Dr. Frank Burch, long recognized as a leader in surgery of the eye in the northwest, was made head of the department. He retired in 1944. In 1930 a separate Division of Otolaryngology was established under the direction of Dr. Horace Newhart, who held this position until his retirement in 1941. At the present time Dr. L. R. Boies is chief of Otolaryngology and Dr. Erling Hanson of Ophthalmology.

Obstetrics and Gynecology. When the Medical School was first organized these departments were separate with Dr. Alex J. Stone professor of gynecology, and Dr. Parks Ritchie professor of obstetrics. The two departments were combined in 1910 under the management of Dr. Jennings Litzenberg, who was made chief in 1913, and whose period of service extended to his retirement in 1938. He was a good teacher of obstetrics and his warm, kindly personality won the love and respect of all his students and colleagues. Another man who won fame in this department was Dr. Fred L. Adair, who served the university from 1903 to 1929. In 1938 Dr. John McKelvey was made head of the department of obstetrics and gynecology on a full-time basis.

Public Health. Prior to 1918 Public Health was nominally included in the Department of Pathology and Bacteriology where it received scant attention. In 1918 Dr. John Sundwall was made professor of hygiene and director of the newly-established Student Health Service. Dr. Sundwall resigned in 1921 and was succeeded by Dr. Harold Diehl who retained this position until he was made dean in 1935. Dr. Gaylord Anderson was appointed professor of preventive medicine and public health in 1937, and in 1945 the School of Public Health was established under the directorship of Dr. Anderson. This school provides training for those who plan careers in public health, and participates in the teaching of medical students.

Roentgenology. Roentgenology developed at Minnesota, as it did elsewhere, as a hospital service and was not established as an independent teaching department until 1935 under Dr. Leo Rigler. Dr. Rigler began his career as roentgenologist at the Minneapolis General Hospital in 1923, and was made roentgenologist to University Hospital in 1927. In 1935 an independent teaching department was established under Dr. Rigler's guidance, and in 1937 he was made chief of the department. This highly efficient department ranks among the foremost in the country. Radiotherapy is directed by Dr. Wilhelm Stenstrom, professor of biophysics.

Cancer Research. The gift of the George Chase Christian cancer hospital by the Citizens Aid Society stimulated cancer research in the Medical School. In 1942 Dr. John Bittner was made proefssor of cancer biology, which is now a research unit with graduate students but with no undergraduate teaching. Dr. Bittner's discovery that cancer of the breast in mice is transmitted to the offspring by a virus in the mother's milk is one of the important contributions of experimental cancer research to the problem of cancer.

The story of the Medical School would be incomplete without mention of our beloved William A. O'Brien who for many years directed postgraduate medical education. Dr. O'Brien really created this position for himself. He had an unusual ability to popularize medical knowledge and to promote good feeling, and he convinced the medical profession of the state that the Medical School wanted to help them keep abreast of current medical thought.

The past decade has brought about a great improvement in clinical teaching. The largely didactic teaching of former years has been almost completely replaced by direct contact of the students with patients in the wards and the dispensaries. The superiority of this method of teaching is now soundly established.

The Medical School of the University of Minnesota is now a source of pride to its alumni and friends. In nearly all departments good teaching and research are being carried on. Only the senior members of the faculty realize what a struggle was required to bring the Medical School to this high level. The administrative officers have a great responsibility. It is easy to slip backward. A few mistakes in major appointments might turn the clock back a quarter century. It has been amply demonstrated that clinical departments need a few full-time men with creative minds in positions of leadership and that teaching and research are both essential to a successful department.

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MEDICAL SCHOOL ORGANIZED

". . . The Board of Instructors have organized the ST. PAUL SCHOOL FOR MEDICAL INSTRUCTION."

Plan of Instruction

"The plan of instruction is designed to be in all respects thoroughly practical, using all available means of illustration. The mode of teaching is by daily examinations, conducted by one of the teachers, at his office, and by occasional lectures and regular cliniques, conjoined with oral discussions, in which all the students participate.

"The fact that practical anatomy can be taught each year forms one of the strongest arguments in favor of thus dividing the labor amongst several instructors. Lectures upon special and surgical anatomy will be regularly given, and students will have the opportunity of performing all the principal surgical operations on the cadaver, under the eye of the teacher.

"It will be the special aim of the instructor to make available all the clinical material possible, and the amount of actual contact of the students with patients will be great, as several of the instructors are connected with medical institutions and with public service. Aside from all regular cliniques, each teacher will take pains to show to students all operations which he may perform, and all interesting cases in his practice, where it is practicable so to do. Students here have the privilege of attending the practice at St. Joseph's Hospital, where a large number of patients are treated annually.

"The Summer Term, for 1871, will begin the first Thursday in June, and continue sixteen weeks, closing before the beginning of the winter course at either of the Chicago colleges.

The fees for the whole year (*excluding dissections) are $50.00; for the summer term alone, $30.00; for the winter term alone, $25.00.

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Material furnished students at cost price.

Northwestern Medical and Surgical Journal 1:343, 1870

Meet Our Contributors

Erwin H. Ackerknecht, M.D. (University of Leipzig Medical School, 1931), is professor of the history of medicine at the University of Wisconsin Medical School. He is a member of the American Association of the History of Medicine, History of Science Society, Wisconsin Historical Society, and a Fellow of the American Anthropological Association. He was the Fielding H. Garrison lecturer in 1948.

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J. D. Adamson, M.D., was graduated from the University of Manitoba, with graduate study at St. Bart's Hospital in London, and other European medical centers. He serves on the medical faculty, University of Manitoba, and holds membership in the Manitoba Medical Association, British Medical Association in Canada, Winnipeg Medical Society, and is a frequent contributor to medical journals.

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Gaylord West Anderson, M.D., was graduated from Harvard Medical School, specializes in epidemiology, and heads the School of Public Health at the University of Minnesota.

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E. T. Bell, M.D. (University of Missouri Medical School, 1903) has headed the University of Minnesota department of pathology since 1920. He is a past president of the American Association of pathologists and the American Association of Cancer Research, a member of A.M.A. and the Society of Experimental Pathologists. His published work includes a monograph on renal diseases.

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William Emmett Donahoe, M.D., was graduated from the University of Illinois Medical School, specializes in pediatrics in Sioux Falls, South Dakota. He is a member of the Seventh District Medical Society, the South Dakota State Medical Association, South Dakota Health Officers Association, American Academy of Pediatrics, and others.

◆

Frank Earl Burch, M.D., was graduated from the University of Minnesota Medical School, specialized in ophthalmology, headed the department of ophthalmology at the University of Minnesota from 1926 to 1947. He is a Fellow of the American College of Surgeons, county and state medical societies, A.M.A., Minnesota Academy of Medicine, Minnesota Academy of Ophthalmology, American Academy of Ophthalmology and Otolaryngology, and the American Ophthalmologic Society.

◆

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Edward L. Tuohy, M.D., was graduated from the University of Minnesota Medical School, specializes in internal medicine in Duluth, Minnesota. He is a past president of the Minnesota Society of Internal Medicine and the Minnesota State Medical Association, and is a member of county and state medical societies, A.M.A., Minnesota Heart Society, Minnesota Society of Internal Medicine, Central Society of Clinical Research, the American Geriatrics Society, Interurban Academy of Medicine, and Sigma Xi.

◆

Irvine McQuarrie, M.D. (Johns Hopkins Medical School), is now professor and head of the department of pediatrics at the University of Minnesota Medical School. He is a member of the American Pediatrics Society, American Academy of Pediatrics, the Northwestern Pediatrics Society, Pediatrics Research Society, American Society for Clinical Investigation, A.M.A., Minnesota State Medical Society, and others.

◆

Alexander Robinson MacLean, M.D., a graduate of the University of Manitoba, is assistant professor of neurology at the Mayo Foundation, and a staff member of the Mayo Clinic. He holds membership in the A.M.A., American Neurological Association, American College of Physicians, Central Society of Clinical Research, Association for Research in Nervous and Mental Diseases, and the Minnesota Society of Neurology and Psychiatry.

◆

Walter Herman Ude, M.D., a graduate of the University of Minnesota Medical School, is the radiologist of St. Mary's and St. Andrew's hospitals and consultant in radiology at the General Hospital in Minneapolis. He is a Fellow of the American College of Radiology, a member of the American Roentgen Ray Society, Radiological Society of North America, A.M.A., and Minnesota State Medical Association.

◆

F. L. Wicks, M.D. (University of Iowa Medical School) specializes in ophthalmology and otolaryngology in Valley City, North Dakota. He is a past president of the North Dakota State Medical Association, past president and secretary of the North Dakota Academy of Ophthalmology and Otolaryngology, and served on the state board of medical examiners. He holds membership in the Sheyenne Valley Medical Society and a fellowship in the A.M.A. He is the author of "Twenty-Five Years of Ophthalmology in North Dakota," and a monograph: "Your Eye — Light on Sight."

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Owen Harding Wangensteen, M.D., was graduated from the University of Minnesota Medical School, now heads the department of surgery at that school. He is a member of the county and state medical associations, the Minnesota Academy of Medicine, Minneapolis Surgical Association, Minnesota Surgical Association, A.M.A., American College of Surgeons, American Association for Thoracic Surgery, American Surgical Association, the American Physiological Society, and has received numerous awards and distinctions.

PEDIATRIC SOCIETY OFFICIALIZES JOURNAL-LANCET

The North Dakota Pediatric Society has announced that it has appointed Journal-Lancet as the official publication for that society. Papers from members will appear in this journal as well as news and notices of meetings.

The last meeting of the society was held on October 15, 1949, in Fargo, and the next meeting is a luncheon scheduled for May 29, 1950, during the State Medical Association Meeting in Grand Forks, at which Dr. Albert Stoesser of Minneapolis will be the speaker.

Reprinted from
1870

THE NORTHWESTERN

MEDICAL AND SURGICAL JOURNAL.

Vol. I. ST. PAUL, OCTOBER, 1870. No. 5.

CEREBRO-SPINAL MENINGITIS.

BY DR. H. GALLOWAY, ROCHESTER, MINN.

Late in the fall of 1863, a number of cases of cerebro-spinal meningitis occurred in my practice, in the northern part of this county. During the winter following, and on until June, cases continued to occur, sufficient in number and severity to entitle them to consideration as an epidemic.

The neighborhood in which the disease chiefly prevailed was only sparsely settled. The topography of the township is of a character to preclude suspicion of malaria or other endemic cause. No marshes; hilly; streams rapid and pure; one brook, the one along which the disease first appeared, abounding in trout. This tributary of the Zumbro is not more than two and a half or three miles long, rises at the base of a limestone hill, runs through a deep ravine, the bluffs on one side being abrupt and rocky; on the other side is a gravelly flat, from eighty to a hundred rods wide, divided up by frequent spurs from the headland. On this flat, at the time I write of, were only two families, they about a mile apart, living in comfortable log houses. No want of drainage, no want of pure water: the only noticeable fact being the surrounding walls of bluff. These families furnished the first cases. In a short time—a week or so—it appeared in other families, showing, thence on, a tendency to attack those in airy situations no less than those in ravines.

One notable circumstance in the way of possible causation deserves mention. Under many of the infected houses, in fact, under all I now remember, were cellars of questionable cleanliness. Some had in them decaying vegetables; some, dirty water; and some, the accumulations of all sorts of refuse.

My case-book exhibits the history and treatment of thirteen cases. Others having nothing peculiar about them, were not registered.

Cerebrospinal Meningitis

Alexander R. MacLean, M.D.[*]
Rochester, Minnesota

My Dear Doctor Galloway:

Your article, "Cerebrospinal Meningitis," appearing in the October, 1870, issue of the *Northwestern Medical and Surgical Journal,* has provoked me to disregard certain practical concepts of time, so that I might write to you on the pages of The Journal-Lancet, some 80 years later.

This honest, acute and speculative description of the disease, occurring in Olmsted County, humbles the modern physician who attempts to duplicate your effort. Today, we can recognize the validity of many of your observations. I am certain that you will not be surprised if certain present concepts related to the cause and treatment of this disorder differ from yours.

In the year 1950, cerebrospinal meningitis, which you characterized as "truly epidemic," although it may occur in "sporadic fashion," is still described in your very words. The cause of epidemics of this disease remains mysterious to us, and the world is plagued with cycles of recurring local disasters. The disease is indeed "inflammatory," with the occurrence of pathologic deposits "within the arachnoides." It varies in severity from the fulminatingly fatal to the minor cases which might be "deemed a common cold or slight fever." As you infer, its spread is capricious; the disease occurs in widely scattered fashion with no apparent causal relationship in respect to topography, watershed or density of population. Your confrères of the last century, however, knew it as a plague of armies and of prisons. Its distribution still remains world wide. In respect to time it would appear to have a predilection for the months of winter and spring, as you have noted.

At the time you wrote your article, you had no concept of what we now call "bacteria"—microscopic unicellular organisms which subsist on organic matter. The vast majority of these organisms are not only innocuous but necessary for the survival of the human race. Some few, however, are the enemies of man, and invade his being, where, in his tissues and humours, they ceaselessly consume twice their weight of human food every hour of the day and night. They manufacture noxious poisons which damage tissue locally and remotely through the flow of blood and lymph.

Pasteur, a Frenchman, was at work in his laboratory, proving these facts, when you were writing this paper. In 1887, seventeen years after your publication, a Viennese, Weichselbaum, discovered the organism which you had battled along a tributary of the Zumbro River. (I might add that the trout are now long since gone.) He named it Diplococcus intracellularis meningitidis. We now call it Neisseria intracellularis because it resembles morphologically an age-old enemy of man intimately associated with Aphrodite, which you astutely recognized by the unmistakable signs of gleet. The disease is not related, as you have suggested, to erysipelas; but this is a very minor point.

The genus and species Neisseria meningitidis are known to be divided into many varieties, differing in the foods they eat and the noxious agents they produce. Two main groups have evolved. Type 1 appears to be responsible for more than 90 per cent of cases of epidemic disease. Type 2—a heterogeneous collection—is found chiefly in sporadic cases and in normal healthy people. The organism has chosen man as host, and under ordinary conditions it lives peacably in the nasopharynx. We are uncertain as to the exact way it invades the body, when it throws aside its saprophytic mask and emerges a true and destructive parasite. Some claim that it passes up the sheaths of the olfactory nerves, directly to the meninges. Others with more evidence state that it invades the blood stream, where it multiplies, producing general signs and symptoms of septicemia, and then localizes in the meninges, where the major battle of life and death takes place.

All available evidence points to dissemination of the disease by healthy human carriers, its prevalence depending upon the varying virulence of the organism and the susceptibility of the host. The high fatality rates of 70 per cent are in striking contrast to the morbidity rates of 0.01 to 0.3 per cent in the population exposed to the risk.

So much for generalizations concerning our modern concepts of the topic under consideration.

Your description of the clinical picture of the onset, progress and termination of the disease cannot be excelled in this day. Our drably fastidious medical literature shuns such splendid adjectives as "snapping" pain through the head, and "lugging ache" in the neck. It is also apparent that we do not make all available use of our eyes and nose and ears in the differential diagnosis. Witness your acute observation of the "drawing together of the scapulae" in patients with meningitis. We have all seen this, but we have seen it with blind eyes, and it has not made its proper impression on our clinical consciousness. Again you insist and repeat, "that in the coma that preceded death, stertor was present in no instance." I must confess that as I read this I was somewhat irritated by your apparent old-fashioned obsession with what seemed to be a trivial detail which could have no clinical significance. Yet, reflection associated with a few experimental maneuvers demonstrates that you have noted with your acute ears the absence of significant sounds which to us have no meaning. As the diaphragm of the soft palate flaps in the wind of inspiration, its noisy movements which we call "snore," can be altered significantly and even obliterated by retraction of the head. As I sit here and consciously and wilfully snore, I can stop this noise by extending my head into the position assumed by a patient who has meningeal irritation. I can feel the tautness of my levator palatini muscles as they guy my soft palate into immobility. Henceforth the breathing of patients in coma will have significance to me. If stertor is absent we should suspect, as you have told us, that the posterior cervical muscles are retracting the head, and that meningitis may be the cause.

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[*]Sections on Neurology and Psychiatry, Mayo Clinic, Rochester, Minnesota.

Now perhaps it would be wise for me and of interest to you to delineate briefly the mechanisms of laboratory aids which more than compensate for our atrophied clinical senses. Medicine has evolved through the years a technic of examining the cerebrospinal fluid which was inaccessible to you. Many types of meningitis have been discovered by this method, but roughly speaking we can divide them into three broad groups: the meningococcic, the septic and the tubercular.

If the cerebrospinal fluid is frankly turbid when it is withdrawn, we can be fairly certain that we are dealing with meningitis of either group 1 or 2. The septic purulent type usually is secondary to an obvious primary focus, such as a draining ear, sinusitis, a head wound, an infectious disease or some septic focus elsewhere in the body. The organism is either a streptococcus or a pneumococcus, and must be identified by culture.

If there is no obvious primary septic focus in acute meningitis with purulent cerebrospinal fluid, the odds are that we are dealing with Neisseria meningitidis. Again, absolute corroboration depends upon culture of the organism, although a simple slide preparation may demonstrate the gram-negative intracellular diplococci. In this respect I must warn you that otitis media caused by the pneumococcus may deceive even the most experienced. The ear-drum may be but slightly injected or edematous, and may be easily missed in the search for a primary focus. However, if the patient previously has been in good health, and free from earache, if petechiae can be observed in the skin, and particularly if other cases are known in the neighborhood, our impression becomes solidified, and we institute specific therapy before laboratory confirmation.

If the cerebrospinal fluid of a patient who exhibits distinct signs of meningitis, whose symptoms have come on insidiously, and whose family may contain members suffering from the disease, is clear or slightly turbid and contains cells, the modern physician considers the possibility of a tubercular infection. With an acute onset, and with no family history in the presence of a grossly clear cerebrospinal fluid, consideration is given primarily to a group of virus infection.

Several other features in the modern clinical approach to meningococcic meningitis may interest you. Occasionally, the patient may present a picture of septicemia of many days' duration, without involvement of the meninges. In such a case the diagnosis can be made only after blood culture. When results of culture are positive, but stiff neck or other signs of meningeal irritation are not present, the physician might consider examination of the cerebrospinal fluid. This, in my experience, is dangerous, for within twenty-four hours after puncture severe meningitis may ensue, caused either by inoculation of the cerebrospinal fluid with the exploring needle, or by some change in the choroidal cerebrospinal fluid barrier. Since there is nothing to be gained by analysis of the cerebrospinal fluid at this time, such diagnostic temptations should be rigorously repressed.

You have described another variant of the disease in the words: "When the powers of life seemed crushed beyond hope from the very onset . . . the ordinary febrile symptoms were not developed, death taking place apparently from paralysis of the heart." Today we would call this the "Waterhouse-Friderichsen syndrome," in which there is fulminating septicemia, with apoplexy of the adrenal glands and circulatory collapse. Death may occur within a few hours, as you have stated, and the diagnosis may be completely missed in the absence of an epidemic because of the lack of fever and signs of meningitis.

I am certain that it will not surprise you to learn that our treatment of patients differs radically from that which you employed with such admirable insight and restraint. Your scientific attitude is demonstrated by the controls you applied. One patient was "mercurialized, blistered, quininized, stimulated, and—died on the ninth day. The children were *not* mercurialized, *not* blistered, but were sweated, given quinine, brandy, and iron, and got well after a run of six weeks." I am tempted to add that they need not have been quininized, alcoholized, or ferrousized, but that would be facetious. Heat in the form of hot packs is still used today in some neurologic conditions, but control studies are not enthusiastically entered into.

It will surprise you to learn that the specific weapons we use today were to be found in the soot of the chimneys of the houses of your patients, and in their cellars among the refuse and the decaying vegetables. Derived from coal tar, the azo dye, prontosil, was discovered to have a marked chemotherapeutic activity against streptococcic infections. The active portion of the molecule, p-aminobenzene sulfonamide, was found to be capable of modification to form a new series of compounds which are bacteriostatic rather than bactericidal. These compounds attack Neisseria meningitidis by interfering with the enzymic activities of reproduction. In addition, the juices of the green mold, Penicillium, have remarkable powers of inhibiting the growth of pathogenic bacteria among which, again, is Neisseria meningitidis.

Although procedures differ among authorities in respect to the exact role these two agents play in therapy, it is clear that both are efficient weapons against the ravages of the disease under consideration. Sulfapyridine, sulfathiazole, sulfadiazine and sulfamerazine may be used with close to equal benefit. If adequate doses are used, the concentrations of these agents in the blood need not be meticulously scrutinized. According to

Hoyne and Brown[1] the initial dose for adult persons ranges between 5 and 7 gm., depending not on body weight, but on the severity and duration of the illness. The first time the drug chosen is used, it is administered intravenously in a 5 per cent solution of the sodium salt in isotonic solution of sodium chloride. This is followed by 1 to 2 grams given by mouth every four hours, except when sulfamerazine is used, in which case the drug is given at intervals of six to eight hours. For children the initial dose is 3 to 5 grams with 1 gram being given thereafter every four hours. The average duration of treatment is eight days.

Many of us believe that in addition to the sulfonamides, penicillin plays a definite role in the treatment of cerebrospinal meningitis, particularly during the first few hours during which a definite diagnosis has yet to be established by the laboratory, or if the patient is sensitive to sulfonamides. As a general rule, penicillin is administered intramuscularly and immediately with the sulfonamide, in amounts of 30,000 units every three hours. Administration of this amount is continued during the course of therapy. Enormous doses may be used against overwhelming infections; these may range up to 1,000,000 units given every two hours. In addition, some physicians instil penicillin into the subarachnoid space in amounts of 10,000 units in 10 cc. of isotonic solution of sodium chloride. Intrathecal injection is repeated on several occasions and then is discontinued.

It is doubtful that, so far as we now know, adrenal cortical extract contributes significantly to the treatment of the dread Waterhouse-Friderichsen syndrome. Theoretically, the extract would have to be administered in amounts of up to 100 cc. a day to compensate for the lack of essential adrenal hormones. Although life certainly cannot be measured in terms of dollars and cents, such amounts are well-nigh prohibitive in cost.

To demonstrate that there have been advances in the therapy of cerebrospinal meningitis, we need only look at the mortality rate of 70 per cent which the disease exacted in the last century, glance at the best results of specific serum treatment which never decreased this rate to less than 25 per cent, and compare these with modern, consistent results which yield only 16 per cent of patients to death. We have come a long way.

And so I must close this communication with the hope that some day a letter may be written by someone else, disclosing therapeutic wonders which no doubt will come from strange places, as far apart as are the cosmic radiations of the atmosphere and the green bile of an ox.

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Reprinted from
1870

THE MICROSCOPE AS A DIAGNOSTIC AID

It is hardly probable that the consummation of science is close at hand. The microscope is doing something towards the accomplishment of the desired end. It has enabled men to see and classify beings too small to be observed by unaided vision. It has revealed the elementary structure of animals and vegetable tissues. It is a curious and interesting instrument, but it can not do everything. If we overestimate we do an injury. We can not tell by looking through the microscope whether a given substance is poisonous or edible. It is of quite limited use in diagnosis, and for practical purposes it is of secondary utility. We can detect the different salts of the urine by their peculiar crystals, and certain vegetable fungi in some diseases of the skin, and we can find vibriones and sarcini in the ejecta of certain diseases. It is claimed that pathological products, as tubercle, cancer, etc., are distinguishable by the microscope, and that this instrument is the only infallible means of determining whether or not a given morbid product is cancerous. . . . I know of no law in medicine that under any and all circumstances will hold the same, nor do I believe this will prove an exception.

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Reprinted from

1870

CHILDREN: THEIR DISEASES AND TREATMENT.

THE SEMI-ANNUAL ESSAY BY BREWER MATTOCKS, M. D., ST. PAUL.

Fully one-half of the deaths that occur in the daily practice of the physician, are of infants—children under five years of age. Fully two-thirds of the patients we are called upon to visit are children. These facts induced us to write upon "Children—their Diseases and Treatment." Medicine and sentiment possess little in common from a practical standpoint, perhaps it is as it should be; yet at times sympathy adds to the armament of the physician's zeal. This in turn increases his desire for knowledge, "while knowledge is power." And nowhere in the whole range of the practice of medicine, is *medical power* more needed than in the treatment of children. If it were possible we would excite in your hearts a feeling of symyathy for childhood—for infancy—with their sufferings and their trials. We would claim professional sympathy for their helplessness. We are assured this appeal is unnecessary. We all have sympathy for childhood—have we not children of our own? True we have children of our own; and scarcely an hour passes but most of us here present, in mind lose a momentary sight of our profession, in thought of our little ones at home. Never do we retire to rest without first looking at our babies—at every wakening in the night we instinctively turn to the cradle. This is not a professional sympathy, it is but natural affection. Professional sympathy must be demonstrated by professional aid. That we may be successful in understanding the diseases of children and their treatment, sympathy must largely actuate our every endeavor.

What do we understand by the mere infant. The law defines an infant as one under twenty-one years of age. Shakspeare can see in infancy nothing but a creature, "mewling and puking in the nurse's arms." Anatomy recognizes an infant as a miniature man. Physiology, a man lacking in some of his functions. While pathology can but see in the infant our equal A popular impression seems to prevail in the profession that children are peculiarly organized—that they are in fact a different species from their adult relatives, and consequently they are to be treated from an entirely different standpoint.

Eighty Years of Progress in Pediatrics

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When Dr. Brewer Mattocks wrote his dissertation on "Children: Their Diseases and Treatment," which was published in Volume I of Journal-Lancet (1870), pediatrics had not as yet been conceived as a special field of medical practice. There were no physicians in America who confined their work exclusively to the care of infants and children. No professional society was dedicated to the advancement of child health and no special pediatric journal was published. There being no separate department of pediatrics in medical schools at the time, teaching of the subject consisted solely of a few lectures on diseases peculiar to the first few years of life. These were given in connection with long-established courses in either obstetrics or internal medicine.

The only obvious explanation for this delayed development of special interest in the field was the almost complete lack of factual information regarding the norms for health in the immature, growing child, on the one hand, and ignorance concerning the nature of the many diseases with which he was afflicted on the other. Except for the adoption of Jennerian vaccination against smallpox and the more recently established practice of substituting diluted cow's milk for the older "bread-soaked-in-sweetened-water" formula in the artificial feeding of infants, little progress had been made in the health care of children beyond the primitive folk medicine of the seventeenth century.

The preoccupation of the busy practicing physician with the less obscure problems of his adult patients resulted in shameful disregard of illness in the very young. As a consequence of this neglect and colossal ignorance on the part of both parents and practitioners regarding the most common diseases of childhood, the morbidity and mortality among infants and children was appalling, as attested by the statement of Dr. Mattocks that "fully half of the deaths that occur in the daily practice of the physician are of infants—children under five years of age." While the essay written by him was a sincere plea for a more sympathetic attitude on the part of his fellow practitioners toward the medical care of children, he argues therein against the emerging tendency toward specialization in the field. To him the infant or young child was but a "miniature adult," requiring no other treatment when ill than that prescribed for grownups. Regarding the status of the problem of specialization he says, "A popular impression seems to prevail in the profession that children are peculiarly organized—that they are in fact a different species from their adult relatives and consequently they are to be treated from an entirely different standpoint." Further on he says, "We are not averse to special departments of medicine in the hands of able men, but yet we do most emphatically oppose the treatment of children as a special branch of practice."

While this devoted friend of children championed a viewpoint which was later to be proved untenable, his attitude finds explanation in the undeveloped state of medical science and practice generally in 1870. Knowledge of the basic principles of human growth and development, both physical and mental, was all but nonexistent until twenty-five years later when one of America's pioneer physiologists, William Townsend Porter, reported the results of his research on the subject of growth of children. Likewise no exact information regarding the special requirements for normal nutrition in infancy and childhood was to become available to practicing physicians for nearly thirty years, when scientific investigation of the subject was initiated by Heubner and Rubner in Germany. Knowledge concerning the physiology of human digestion, which had acrued from Beaumont's classical experiments on Alexis St. Martin (1825) had not yet found application in clinical practice among children.

In the year 1870 the sciences of microbiology and immunology were still in an embryonic stage. Pasteur, Koch and their illustrious contemporaries had not as yet demonstrated that different infectious diseases are caused by specific micro-organisms, that the latter can be destroyed by heat (Pasteurization) and other agents and that specific immunity to certain infectious diseases can be induced by the killed or attenuated living causative micro-organisms or their metabolic products. Specific serological and skin tests for use in diagnosis were yet to be discovered. Physiological chemistry as applied to clinical medicine was in its infancy. Roentgen did not discover the x-ray and its invaluable use in diagnosis until twenty-five years later (1895). It is no wonder then that the field of pediatrics, which is so peculiarly objective in character and so manifestly dependent upon the basic sciences for its development, was not organized as a full-fledged special branch of medical practice in America or elsewhere until near the "noonday of the golden age of discovery" in the latter quarter of the nineteenth century.

As a result of the unprecedented flood of fundamental discoveries which began to flow from the research laboratories and clinics of Europe and the United States at that time, pediatrics finally emerged as a new branch of scientific and clinical medicine practically unfettered by false traditions and accumulated misinformation which long encumbered the older medical disciplines. Although

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Abraham Jacobi, often called the Nestor of American pediatrics, had established a special clinic for children as early as 1860, the first recognized university department devoted to the field was that organized at Harvard University by Thomas Morgan Rotch in 1888. The American Pediatric Society was founded in the same year. Progress since that time in the acquisition of information regarding the causes and treatment of various diseases, in the development of new techniques for use in diagnosis and treatment of childhood disorders, in building hospitals and clinics for infants and children, in establishing pediatric departments in medical schools and in organizing child welfare programs of various kinds, has been truly amazing.

While the physician of 1870 possessed practically no information regarding the primary etiology of the infectious and nutritional diseases afflicting infants and children, it is now exceptional for the properly trained pediatrician to encounter a seriously ill patient whose disease he cannot diagnose from an etiological standpoint, particularly if he has access to the resources of a well selected medical library and a well equipped clinical laboratory. Furthermore, the most serious diseases of nutrition, such as rickets, scurvy, xerophthalmia, beriberi, pellagra and other avitaminoses, as well as protein-deficiency and mineral-deficiency states, once so prevalent, can now be prevented or cured at will as a result of discoveries relating to the essential character of certain food factors. The contagious diseases, such as diphtheria, whooping cough, smallpox and typhoid fever, which occurred in extensive epidemics and often with catastrophic results in that early period, are now encountered so infrequently in the United States as a result of extensive immunization programs that pediatric teaching clinics are frequently unable to find suitable cases of the kind for demonstration to medical students and interns.

The enteric or diarrheal diseases of infectious origin, such as typhoid and paratyphoid fevers, Asiatic cholera and the dysenteries (bacillary and amebic) have now become clinical rarities in those parts of America and Europe where approved public sanitation practices, immunization programs and rational clinical practice have been employed consistently. Congenital syphilis, extremely common before efficient diagnostic and therapeutic methods became available, has decreased almost to the vanishing point in some parts of the United States. This change has been achieved largely as a result of campaigns to discover acquired syphilis in adults, particularly in pregnant women, by means of the Wassermann, Kahn and other specific tests and to institute intensive chemotherapy as early as possible. Tuberculosis in children has likewise become somewhat of a clinical rarity in certain parts of this country as a result of extensive programs of case finding (by means of tuberculin skin tests and chest x-ray examinations) and effective isolation of all persons having the disease in active form. In some parts of the world where tuberculosis has long been rampant and where isolation has been neglected, BCG vaccination of children is being retried on a wide scale, with the hope of reducing the morbidity and mortality from the disease. The grand climax of achievement in the treatment of infectious diseases in infancy and childhood came with the demonstration of the medicinal value of certain sulfonamide drugs in the mid-1930s and the still more significant discovery during the 1940s of a constellation of antibiotic agents with therapeutic efficaciousness ranging throughout the entire list of known infections with a few notable exceptions.

Only yesterday, speaking figuratively, the diagnosis of congenital heart disease was not possible and effective treatment was undreamed of. The great majority of children with the affliction did not live to the age of puberty. Today the picture is rosy in comparison. Through vast improvements in the techniques of diagnosis and in the skill of the surgeon, an ever-increasing percentage of such children who were formerly doomed to invalidism and early death, are now given a significant extension of life and are spared most of the discomforts of a handicapped existence.

Up to 1870 and for more than a half century thereafter diabetes mellitus was regarded as an almost uniformly fatal disease in children. Today, as a result of the discovery of insulin less than three decades ago, most diabetic children can be saved and carried to adulthood in a comparatively good state of general health. Many other endocrine disorders of childhood due to either hypofunction or hyperfunction of one or other of the glands of internal secretion, not recognized as such by the physician of 1870, are today easily diagnosed and are often treated successfully.

Finally, new triumphs over certain other hitherto uncontrollable disorders of childhood, such as severe spontaneous hypoglycemia, acute hemorrhagic nephritis, rheumatic fever, Still's disease (chronic rheumatoid arthritis), chronic ulcerative colitis and other so-called collagenous diseases, have been made possible by the isolation and refinement of two extremely important hormones, cortisone (11-oxy-17-hydroxycorticosterone) from the adrenal cortex, and adrenocorticotropic hormone (ACTH) from the anterior lobe of the pituitary gland. Many additional advances will undoubtedly be made as a result of further research in this promising field.

With this greatly abbreviated recitation of scientific achievements which have contributed so enormously to solution of the problems of child health, it is not difficult to understand why the average life expectancy of man has increased from less than 40 to more than 67 years since 1870. The infant mortality rate (number of deaths in the first year of life per 1,000 live births) has decreased during the past eighty years from approximately 190 to 26. Instead of more than half of the total deaths among the whole population of Minnesota occurring in infants and children under the age of 5 years, as they did in Dr. Mattock's day, less than 7 per cent of the total deaths now occur in children under 12 years of age in this state.

With the conquest of many of the once severely debilitating or death-dealing diseases of infants and children achieved, other aspects of the medical care of children, such as the prevention or correction of disturbances in mental and emotional development, have happily come to occupy a larger proportion of the physician's time. Since, as recent surveys have shown, three-fourths of all medical care for infants and children is provided by general practitioners, it is essential that the latter receive more scientific and clinical training in the field of pediatrics, if the gains in child health already made in some areas are to be maintained and extended.

As pointed out elsewhere,[1] "Pediatrics is no longer regarded as a narrow medical specialty confined to the diagnosis and treatment of childhood diseases. It is more appropriately defined today as that division of medical science and practice which deals with all aspects of the physical, mental and emotional health of the human race throughout infancy, childhood and adolescence. The primary differences between pediatrics and the other medical specialties are, first, that pediatrics is concerned with the whole person instead of a single organ system or a particular region of the body and, second, that it deals in the main with persons of different sizes who are undergoing continuous change of a developmental nature. Indeed, the factors of growth and development with their peculiar impact on every type of health problem, constitute the only justification for setting pediatrics apart as a special medical discipline.

"The breadth of its scope and the implications of its over-all significance, not only for the prevention and treatment of disease, but also for the promotion of a maximal degree of physical fitness and emotional well-being, have resulted finally in the elevation of pediatrics to the status of a major department in the leading medical schools of America." As medical science grows and as society becomes more cognizant of the potentialities of a dynamic life-long program for preservation of health, the role of pediatrics will undoubtedly be greatly extended instead of being allowed to revert to a place of insignificance, such as it held in the year 1870.

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Reprinted from
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From MEDICAL NOTES

Injurious effects of feeding infants too early.—In the *Baltimore Medical Bulletin* for May 16, 1870, Dr. Horace Smoot, of Virginia, has these sound remarks:

"Generally there is an interval of two or three days between the birth of a child and the formation of milk in the mother's breast, during which time old women, and sometimes physicians, think it absolutely necessary that the little thing should be fed; consequently, they set about to prepare something for the child to eat, or rather to drink, as a nutriment. And the result is, the stomach of the child is crammed with whatever the nurse may fancy to be good for it. This, in our humble judgment, is decidedly injurious. The child ought not to take anything into the stomach in the first hours of its extra-uterine life. Nature teaches this by the fact that the mother's milk is not formed for two or three days after its birth; and we may rest assured that she has made every necessary provision for the child, in the way of furnishing it nutriment.

"Again, the child should not be fed with a spoon; because, in the act of sucking, the salivary glands are excited to pour out their secretions, which mix with the mother's milk, and assist in digestion in the following manner: These secretions are alkaline in their character. The predominance may be caused thus: There are articles of diet which, under particular circumstances, become suddenly acid. Milk is one of these. This fluid, it is well known, becomes acid almost instantaneously, when the air is highly charged with electricity; and there is reason to believe that something similar may occur in the stomach, particularly in children. So that it becomes necessary that an alkali should be incorporated in the milk to neutralize this acidity. Now, if it were food exactly similar in its composition to the mother's milk, it would not answer the same purpose when given to the child in a spoon; because it would not be mixed with the saliva as it is when the child receives it by sucking. When it is poured down the stomach with a spoon, without the addition of this alkali, we may expect colic, swelled bellies, etc., in the children thus treated."

Half Yearly Compendium of Medical Science.
Northwestern Medical and Surgical Journal 1:160, 1870

Reprinted from
1870

THE NORTHWESTERN

MEDICAL AND SURGICAL JOURNAL.

VOL. I. ST. PAUL, MARCH, 1871. No. 9.

A CASE OF HÆMORRHOIDS.

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The following case is reported, not because it is thought to present any features that are novel or striking, but because it illustrates well a common and very distressing form of hæmorrhoidal disease, and the appropriate method of cure.

Mrs. ——, a widow lady, aged 53, came under my care in the early part of September, 1870, suffering severely with internal piles. She was constitutionally prone to hæmorrhoids, and had been afflicted with them more or less during the greater part of her mature life. Four years previously a large internal pile, which descended whenever defecation occurred, and gave a great deal of pain, was removed with the ecraseur by a female practitioner. The operation, judging from her account of the case, was followed by internal bleeding, the sphincter ani not allowing the blood to escape from the rectum. A low form of fever set in, from which convalescence was prolonged. Since the operation, she says her disease has been worse. She came into my hands from another practitioner, who had been dosing her with saline laxatives, opiates, &c., without the slightest advantage, but rather the reverse—he having never even examined the tumors by inspection or otherwise.

At this time her condition was truly deplorable. After every passage from the bowels, an operation attended by almost intolerable agony, if we may believe her own statement, a nodulated, dark purple mass, as large as half a hen's egg, or larger, was seen protruding from the anus. Evidently, the whole mucous membrane of the lower part of the rectum partook, to a greater or less extent, of the hæmorrhoidal thickening and congestion. The pain after defecation was of a burning and lancinating character, often extending to the thighs and back, or even to the head. The general appearance of the patient was cachectic. Complexion sallow. Ultimate nutrition defective. Bowels inclined to laxity rather than costiveness. The case was plainly

The Odyssey of Proctology

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It has been said that the only interest in the sex life of a hippopotamus is that displayed by a hippopotamus of the opposite sex. If this applies to the subject of proctology the number of readers of this dissertation may be comparatively few. Still, as in the case of the hippopotamus, there may be some interested from a purely academic point of view.

Although proctology as a specialty did not come into official existence until 1899, rectal diseases were considered of such importance and interest to the medical profession that an article on the subject was included in the first issue of the Northwest's first medical journal published in 1870. If we consider the entire history of proctologic conditions we must go back to antiquity.

Progress in the care of rectal diseases may be divided into five periods, the first being the era from about 2100 B.C. to about 400 B.C.; the second from about 400 B.C. to the time of John Aderne in the fourteenth century; the third from John Aderne to the founding of St. Marks Hospital in London in 1835; the fourth period from 1835 to the founding of the American Proctologic Society in 1899; and the fifth, the fifty years from 1899 to 1949, culminating in the recognition of the American Board of Proctology as an independent board by the Advisory Board of Medical Specialties and Council on Medical Education and Hospitals of the American Medical Association.

One of the first medical references to the proctologic subject dates back to the Code of Hammurabi, King of Babylonia, about 2100 B.C.; which decreed: "If a doctor . . . has cured the diseased bowel the patient shall give five shekels of silver to the doctor." Other references appear in the Egyptian literature (1550 B.C.) and the Hindu writings (1000 B.C.). In the Old Testament, references appear in First Samuel, Second Chronicles and Deuteronomy. There is some question, however, as to whether the diseases mentioned in these ancient writings are exactly the same as we understand them now. References made around 400 B.C., however, undoubtedly refer to the same conditions as we know them today. At this time the works of Hippocrates appeared and there is definite reference made to the use of a rectal speculum, to quote: "laying the patient on his back and examining the ulcerated part of the bowel by means of the rectal speculum." Celsus (A.D. 1(?)–50) advised the treatment of fistula by knife or ligation. In the sixth century, A.D., Aetius, court physician in Constantinople, advised actual cautery for the treatment of procedentia. In the same sixth century proctology acquired a patron saint, St. Fiacre, an Irish saint of great piety and noble descent, who became the patron for those suffering from hemorrhoids. With the help of his disciples he went to France and with the permission of Saint Faro, the Bishop of Meaux, established a monastery at Prodelus (the modern Brueil) in the Province of Brie. In 1013 the famous physician Albucasis, a thousand years after Celsus, wrote on fistula and taught that complete fistula was incurable except in rare instances.

William de Salicet (1245) of Bologna, considered the most skillful surgeon of his age, wrote: "When the fistula is complete it is assuredly so difficult to cure that it is better and more honorable for the surgeon to give up the case at once." Numerous other surgeons of this time wrote concerning rectal conditions but without exception they were a rehash of other opinions and without practical suggestion as to the improvement of existing treatment.

This situation continued until 1376, when a discussion of rectal diseases, "Treatises of Fistula in Ano, Hemorrhoids and Clysters," was published by John Aderne, an English surgeon. Definitely and without equivocation, Aderne laid down for the first time a principle in the treatment of fistula which is still accepted at the present time. He stated that in complete fistulas it is necessary to completely divide all the tissue overlying the tract from end to end if a cure is to be effected. Aderne, a general surgeon who was born in 1307, gave such impetus to the interest in rectal diseases that a succession of English surgeons gave special attention to this work. They were, in order of their time: Thomas Morstede, a pupil of Aderne himself, and who died in 1450; Richard Ferris, who died in 1566; William Clowes (1540-1604); John Woodall (1556-1643); Richard Weisman (1622-1676); Samuel Sharp (1700-1778) of Guys Hospital; and Percival Pott (1714-1788) of St. Bartholomews.

Richard Weisman wrote an excellent text entitled "Chiurgical Treatises." I am fortunate enough to have a copy of a fourth edition of the "Chiurgical Treatises" which was published in 1705, about thirty years after his death. In this book is a preface to the first edition dated May 24, 1676, so the first edition must have been published the same year as his death. In this text some thirty pages are devoted to the diagnosis and treatment of rectal disease.

This interest in rectal and colon diseases continued among English surgeons and led to the founding in 1835 of St. Marks Hospital in London—the first hospital devoted wholly to the treatment of rectal and colon diseases. The hospital charter states it was organized "for the treatment of fistula and other diseases of the rectum." To quote from an address issued at that time by Mr. William Salmon: "To the latter class (rectal diseases) belong the maladies which this infant charity . . . is especially designed to eliminate: of which it may in truth be said there are none more afflicting or distressing to bear: or which produce more serious consequences: which it may be doubtful whether there be any branch of medical knowledge for the acquisition of which less facility has hitherto been afforded, etc." Unfortunately, this last observation could almost be as well made today. St. Marks Hospital thus became the mecca for those particularly interested in rectal diseases. Salmon, Allingham, Sir Gordon Watson, Lockhart Mummery, Gabriel, Dukes, Naunton Morgan, and many other names associated with the advancement in the care of rectal diseases are also associated with St. Marks Hospital.

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At a later date the Gordon Hospital was established also for the treatment of rectal conditions. Of this institution perhaps the most well known surgeon was the late Mr. Ernest F. Miels who devised the well known operation of abdominoperineal excision for rectal cancer. At the present time his pupil, Mr. C. Lawrence Abel, is carrying on this splendid work of Miles. The great majority of the older and many younger American proctologists have at one time or another visited these hospitals.

America may justly be said to be the home of the specialty proctology as an entity. The first American to attract attention to his treatment of rectal diseases was William Bodenhamer, of New York. He was well known there, devised a number of instruments and in 1860 published an article on "Congenital Malformation of the Rectum and Anus." However, he did little to interest others in the specialty. The real father of proctology was Dr. Joseph W. Matthews of Louisville, Kentucky. After practicing in Louisville for a few years he determined to limit his work to proctology and in 1877 came to New York to seek knowledge on this subject. Disappointed in what he saw there he went to London to St. Marks Hospital, where he met Allingham, who was then senior surgeon. After a prolonged stay at St. Marks he returned to Louisville, established his practice there, and four years later was made head of rectal surgery at the Kentucky Medical College. In 1892 he completed his text on rectal diseases, a volume of over 500 pages and the first adequate text on the subject. Matthews was a physician of character, ability and dynamic energy. He published many papers and served numerous offices in both his local and state medical societies. The crowning political achievement was the Presidency of the American Medical Association in 1899.

In this same year a group of proctologists decided to get together for the purpose of exchanging information concerning the treatment of proctologic conditions and to encourage interest in advancement of the specialty. Up to this time each proctologist was more or less a law unto himself, and it was thought that a pooling of information would be advantageous to all concerned. Fifteen men met at the Chittenden Hotel in Columbus, Ohio, June 6-7, 1899, and formed the American Proctologic Society, with Dr. Matthews as its first president.

This was fifty years ago and since that time those interested in proctology have undergone the same discouragements that all other groups have experienced when they wished to break away from general surgery and establish a surgical specialty. Despite this opposition, the membership of the American Proctologic Society has grown from the original membership of 15 in 1899 to 458. Even when the writer joined the organization in 1920, twenty years after its founding, there were but 56 members. The present great increase of members would seem to be an indication of the interest and demand on the part of the public at least for physicians who know something more of rectal and colon diseases than the desire to apply a clamp and hot iron to the anal and rectal tissues or to do a loop colostomy in the presence of complete obstruction. As Dr. Louis Buie once aptly remarked, you could usually tell when a hemorrhoidectomy had been done from the presence of a large amount of blood in the operating room and the sacrificial odor of burning flesh.

Like most other surgical specialties, the early development of proctology was slow but once established has pyramided rapidly. The slow growth of the specialty has in a large measure been due to a lack of opportunity for proctologic training. Even now there are a dozen young men seeking training for every place available. Gradually the number of medical schools including this specialty in their curriculum either as an out-patient or in-patient clinic has increased. Recognition of proctology at the University of Minnesota as a specialty occurred in 1917 when the writer was permitted to establish an out-patient clinic in the old dispensary in the basement of Millard Hall.

The first general recognition of proctology came in 1916, when the American Medical Association established a section of gastro-enterology and proctology. In 1934 the American Board of Proctology was incorporated, the tenth American specialty board to be incorporated. The Advisory Board for Medical Specialties was organized between the years 1933 and 1934 and began to function. The American Board of Proctology sought approval of this body in 1934 but approval was denied pending the formation and approval of the American Board of Surgery. This board was not formed until January, 1937, some three years after the incorporation of the American Board of Proctology. The Surgery Board, when formed, opposed the formation of an independent Board of Proctology but in 1940 provision was made for the certification of proctologists by the American Board of Surgery through a committee of proctologists known as the Central Certifying Committee in Proctology. In 1946 the specialty of proctology was certified by the American Medical Association as satisfactory for the establishment of residencies in approved hospitals. The Central Certifying Committee arrangement was not satisfactory to anyone and on June 15, 1949, an independent board, the American Board of Proctology, was approved by the Advisory Board of Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association. This cumulated fifty years of organized effort to secure proper recognition of a specialty in which the average general surgeon had little interest or knowledge but still was unwilling to give up.

It might now be said that the specialty is entering upon its sixth or mature period. The future problem is to secure sufficient teaching facilities so that those who wish to specialize in this field may do so. This may be expected to come slowly but when there is a public demand this demand is usually met sooner or later. Those of us who are interested in proctology feel that this is the case with rectal diseases and now that an independent board has been established we can expect increasingly adequate facilities to become available.

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Reprinted from
1870

HOSPITAL SERVICE FOR SURGERY PATIENTS

St. Joseph's Hospital.—We are well aware of the many obstacles in the way of the country physician who desires to make conservative surgery a specialty. We know that there are many physicians in the state thoroughly competent for all operations upon male and female patients, but who are restricted in their professional labor by many of the inconveniences of a country residence. Many of their patients live miles from the doctor's office, thus practically forbidding a severe operation at their homes, and yet he is unable to find good accommodation for them in the village or city where he is living. Another of these objections is the scarcity of intelligent, thoughtful nurses.

We would call the attention of physicians thus situated, and who are thus obliged to forego an operation, perhaps of vital necessity to the patient, to St. Joseph's Hospital, of this city.

A private enterprise, undertaken with the noblest of motives, and in the most liberal spirit, by a class of ladies whose very title is synonymous with all that is done for the sick, it well deserves the attention and fostering care of our profession in the state. Undertaken by private individuals, receiving the moral support of the community, some way must of course be devised to make it self-sustaining. Eager as the Sisters were to make it entirely a charity, they were utterly unable to do so. St. Paul was already doing so much towards the support of so many charities that it seemed unwise to ask more of her then. But, doing what few would have the courage or self-denial to undertake, the Sisters give their whole time and attention to the sick, and charge only so much for board and medicine as will absolutely cover the cost. Disdaining empiricism in any form, they selected a hospital staff from the best of the city's regular physicians, who have already given their careful attention to the sick within its wards without charge.

Having thus called the attention of physicians to the Hospital, we would ask them to send those cases desiring operations or hospital care of any kind, who from their locality or peculiar surroundings can not be operated upon at home, to the hospital. We would also state that the hospital has private rooms for the use of those patients who are able to pay for them at a price most reasonable, and that the facilities for the treatment of uterine disease, whether medical or surgical, are superior.

Northwestern Medical and Surgical Journal 1:306, 1870

Reprinted from
1870

THE NORTHWESTERN

MEDICAL AND SURGICAL JOURNAL.

VOL. I. ST. PAUL, DEC. & JAN., 1870-1. No. 7.

ENDEMIC AND EPIDEMIC DISEASES OF MINNESOTA.

An Essay on the above diseases, as they have occurred in this State, must of necessity be very imperfect, from the fact that both Endemic and Epidemic diseases vary in many of their pathological phenomena in the different localities in which they prevail, and professional intercourse and a comparison of experience has as yet, not been intimate enough to render any one observer sufficiently familiar with the subject, to write with that accuracy and knowledge which its importance to the profession and public demands. To do it justice would be to obtain the record of those of our profession whose residence dates back beyond the period of the formation of our State government, and in different localities, as well as those who have more recently made this State their home and the scene of their professional labors. The collated experience of such a record would be valuable; and an Essay, written with such aid, would really be pretentious of the title which forms the subject of this article.

Without such aid, I must draw largely from individual experience, assisted by observations of brethren in the profession with whom I have been brought in contact; but still the experience will be circumscribed and will embrace but a small portion of our State, and not properly fulfilling the requirements of the Committee's circular. The desire to give a brief description of the diseases in the locality in which I have for a number of years (seventeen) resided, which may be of some benefit in the future, when observations from different parts of the State are in the Society's possession, is my only inducement in writing this article.

A very large per centage of the population of this State (then Territory,) in 1855, was made up of invalids and valetudinarians from other portions of the Union, and the various changes incident to a removal from the comforts and confirmed habits of

Endemic and Epidemic Diseases—1870 to 1950

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Eighty years bring changes in all things, including the patterns of infectious disease within a community. During such a span of years, certain diseases may largely disappear as a result of control programs and changes in the economic, social and other factors that have previously contributed to their spread. Other infections may continue undiminished, probably because there has been no such basic change in opportunities for spread, while others may actually increase in prevalence and virulence. It is even possible that new diseases may appear and assume major importance during a span of eighty years.

All of these changes have occurred in Minnesota since Dr. Sweney wrote his account of Endemic and Epidemic Diseases in Minnesota in 1870. The major diseases which he discusses, remittent and intermittent fevers (chiefly malaria but including some cases of typhoid) and enteric (typhoid) fever have all but disappeared, diphtheria has been brought under control, scarlet fever is milder, measles occurs as commonly as before, influenza is just as uncontrolled, and poliomyelitis, encephalitis, brucellosis and tularemia have emerged as new or previously unrecognized infections. The problems of control of the acute infections have changed enormously and, if prophecy may be permitted, will change just as much in the eighty years that lie ahead.

The 19th century has been referred to as one to be marked in epidemiological history as the era of upsurge and dominance of waterborne infections. The industrial revolution introduced a period of urban life which brought people from rural areas, where only some of the wells were specifically contaminated, into cities where all of the available water was dangerous. Water was supplied as an economic and social necessity and without thought of its sanitary quality for no one recognized its role in the spread of disease.

Pioneer Minnesota was no exception. Water was not safe and typhoid was consequently rampant. In 1870 enteric fever was not even associated with faulty disposal of human wastes though Dr. Sweney did recognize its communicability—an idea certainly not universally accepted by his colleagues. Water supplies were not improved until many years later. Even in Minneapolis the public supply was not safe to drink until the second decade of the 20th century. Progress, once started, was made rapidly. Under the pressure of the State Board of Health, an active program of water sanitation (including waste disposal) has brought typhoid to virtually the vanishing point. In 1910, when Minnesota was first included in the U. S. Death Registration area, there were 688 deaths ascribed to typhoid. By 1917 the number had fallen below 100, by 1924 below 50, by 1937 below 10 and in 1943 and 1944 it reached 0. While an occasional death from typhoid will still occur, the disease has been practically eliminated and in years to come will be even more of a curiosity as the existing carriers die off and the reservoir of infection approaches zero. Improvement in water and milk sanitation has been the chief factor in this decline but the rate of disappearance has been greatly accelerated by the active program of epidemiological investigation and typhoid carrier control that was pioneered in Minnesota by the late Dr. Hibbert Hill and Dr. A. J. Chesley.

Concomitant with the elimination of typhoid has been the complete disappearance of cholera. Minnesota was settled a little too late to feel the full impact of the cholera waves of the 19th century but the existence of occasional cases among immigrants as late as 1870 was recognized by Dr. Sweney. It is now many decades since cholera has existed in Minnesota. It may be recorded today as a disease that has been eradicated from the state.

Unfortunately the same cannot be said of the other great waterborne infections, bacillary and amebic dysentery. The latter has never been common as a cause of illness, though an appreciable number of persons are infected as is true in all other parts of the United States. Before World War II, less than a dozen clinically recognizable infections occurred each year. Since the war this has risen to about 25-30 but there is no evidence of importation and wide spread of amebiasis predicted by some as a sequel to the return of troops from Asiatic and tropical war zones.

Bacillary dysentery listed by Dr. Sweney as "observed . . . but not in a severe form" continues as the most common of the intestinal spread infections, though probably spread chiefly by contamination of food by persons suffering from unrecognized infection rather than through contaminated water. The true extent of Shigella infections is certainly not known though undoubtedly many more cases occur than are recorded in the official reports. The strains of Shigella most commonly identified include the Flexner W(II), V(I) and Z(III) and the Sonne I and II.

The second most common of the infections listed by Dr. Sweney—malaria—has become even more scarce than typhoid. In the early days malaria was prevalent throughout the Upper Mississippi Valley. Its decline and ultimate disappearance from this area has been ably chronicled by Ackerknecht in his book *Malaria in the Upper Mississippi Valley*, 1760-1900. Although few specific antimalarial measures have been adopted, ecologic change in the vector incident to clearing of the land and settlement of the area have undoubtedly been factors in reducing the incidence of indigenous malaria close to the vanishing point. Only a rare case has developed in any year and in many years no case is recorded in spite of the fact that suitable anopheline vectors are found in many areas. The latter fact occasioned some apprehension of a resurgence of malaria following the return of troops from malarious war areas. Although many relapses have occurred—60 in 1944, 380 in 1945, 1145 in 1946, 383 in 1947 and 86 in 1948—there has been no evidence that any of these has constituted a source for natural transmission of infection. Only four indigenous cases have been recorded since 1944 and all of these were apparently due to transfusion from a war veteran whose infection had gone unrecognized.

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Although Dr. Sweney made no reference to leprosy—and may well have been unaware of its existence in Minnesota—it is now clear that the disease was being brought into the state with the Norwegian immigrants. This was not surprising as, for unknown reasons, leprosy continued longer in Norway than in any other part of northwestern Europe. The latter part of the 19th century thus saw the establishment of a focus of leprosy in Minnesota that gave rise to a rare indigenous infection. By 1950 this focus had been extinguished for several years, though the exact reasons for its disappearance are not clear. All that is clear is that it was not due to specific control measures as very few restrictions were ever placed upon these leprosy patients.

In contrast to the disappearance of malaria, leprosy and waterborne infections, has been the continuance of acute infections spread through the respiratory tract. Measles, whooping cough, the common cold, scarlet fever, influenza and pneumonia are probably as prevalent as eighty years ago; certainly there is no evidence that they are less common. There has, however, been a striking change in the mortality from all of these. A part of this reduction can be ascribed to better treatment, especially during the past decade with the advent of sulfonamides and the antibiotics. Yet the decline in mortality did not await the discovery of specific therapy. Measles had declined from a three-year average number of deaths of 132 in 1910-12 to only 36 in 1930-32 and to 13 in 1946-48. During the same period the scarlet fever deaths had averaged 193, 35 and 3 respectively and whooping cough 191, 58 and 20. The decline in pneumonia has been less striking. In the respective periods, the deaths averaged 1789, 1951 and 1107 and the death rates 85, 75 and 38 per 100,000 population. The reasons behind these declines, apart from specific therapy, are obscure but probably include better general medical care, popular understanding of child care and natural changes in the virulence of certain infections, notably scarlet fever.

The only striking changes in the acute respiratory infections are those attributed to immunization, viz., control of smallpox and diphtheria. Smallpox, referred to by Dr. Sweney as periodically prevalent and of a comparatively mild type, has all but disappeared though this condition may be only temporary. As recently as 1921 the cases numbered 9375, and 3125 in 1924. Only once before 1942 did the number fall below 100, but in 1943 and 1948 it reached zero. Fortunately, the cases have long been quite generally mild. Only twice since 1910, when Minnesota was admitted to the death registration area, has the number of deaths exceeded 25. In 1924 and 1925 Minnesota shared in a wave of malignant smallpox that affected much of the Midwest, including Detroit, St. Louis and Denver. In these years, the deaths in Minnesota numbered 307 and 198, respectively, but since those years only 8 smallpox deaths have been recorded, the last in 1941.

The decline in diphtheria has been of a very different character but no less striking. When Dr. Sweney wrote in 1870 an extremely malignant form of diphtheria was widespread throughout the United States and Europe. Entire families were stricken by the infection and death of several children in the same home was not a rare event. The disease was highly malignant and treatment by serum, intubation or tracheotomy was unknown. The true death rate in 1870 in Minnesota is unknown. In Massachusetts where official records were then available, the rate was over 150 per 100,000 in the period 1876-80. There is no reason to think that the situation in Minnesota was any less serious. By 1910 the death rate in Minnesota had declined to 27.3 (5012 cases and 566 deaths in a population of 2,075,708). While the advent of specific therapy may have been a factor in the decline, it is certain that other unknown factors have brought about a lessening of the severity of diphtheria with a consequent reduction in both cases and deaths.

Immunization came into use during the 1920s but was somewhat more slowly adopted in Minnesota than in some other parts of the country with a resultant delay in decline in cases and deaths. By 1930, however, the deaths had dropped to 32; in 1940 to 6. At present, diphtheria is somewhat above this record minimum of 1940; in 1948 the deaths numbered 16 and in the intervening years averaged 20, a rate of about 0.7 per 100,000 population. Undoubtedly immunization and natural changes in the virulence of the disease have been factors in this decline; it would be difficult to evaluate the relative importance of each.

So much for the conditions described by Dr. Sweney as endemic in Minnesota in 1870. What of new diseases or infections not recognized by him and his colleagues? Five conditions stand out in this connection—poliomyelitis, encephalitis, brucellosis, tularemia and Rocky Mountain spotted fever. It would be hazardous to say that none of these existed in Minnesota eighty years ago for any or all of them might have escaped recognition. None of them had, however, been described as clinical entities and bacteriologic identification was, of course, unknown. Today the first three are widely spread and the other two occur sporadically. Though they have all attracted marked public attention, and some hysteria, none of them can truthfully be described as a major public health problem.

Poliomyelitis occurs in periodic waves irregularly spaced, the most serious of which have occurred in 1910, 1916, 1921, 1925, 1931, 1946, 1948 and 1949. The worst of these was 1910 when 201 deaths were ascribed to poliomyelitis in a population of 2,075,708 as contrasted with 245 in an estimated population of 2,817,972 in the much advertised 1946 outbreak, rates of 9.7 and 8.7 respectively. The three outbreaks in the last four years have, however, given rise to the impression of a permanent change toward increased prevalence, but four years is too short a period in the natural history of any disease to warrant such conclusions.

Encephalitis has never reached the same proportions. In the early 1920s, Minnesota shared in the wave of encephalitis lethargica (von Economo type) that was experienced elsewhere in the United States and in Europe. Reaching a peak of 121 deaths in 1923, the disease has gradually declined and ultimately reached the vanishing point in Minnesota as elsewhere. But a new form of encephalitis has appeared—equine encephalomyelitis. Causing numerous and serious epizootics in horses, it became quite widespread in man in 1941 when 794 reported cases and 90 deaths occurred in Minnesota as part of an outbreak that involved the Dakotas (especially North Dakota) and southern Manitoba. Numerous cases have occurred in subsequent years but never approximating the 1941 situation. Unquestionably, certain species of mosquitoes may serve as a vector in Minnesota as has been demonstrated in other areas where human infections with equine encephalitis virus occur.

Brucellosis has certainly occurred in Minnesota far longer than is suggested by the official records. Since 1927, when it was first made reportable, about four thousand human infections have been recorded; but this is certainly a gross underestimate of the total incidence or prevalence of the infections as many cases occur in subclinical form. The cases fall into three groups: (1) users of raw milk having no contact with infected animals, (2) farmers and their families infected either through contact or raw milk and (3) veterinarians, slaughterhouse workers and others coming into contact with the tissues of infected animals. The relative importance of contact and of raw milk consumption as the determining factor in the spread of brucellosis in Minnesota is debatable as both types of exposure occur in so many of the cases.

Tularemia, first described in 1910, was not recognized in Minnesota until 1926. Since then over 450 human infections have occurred, chiefly from handling of wild rabbits, less commonly from bites by infected ticks. Ticks have likewise been responsible for an occasional case of Rocky Mountain spotted fever, a disease equally unknown in 1870, though possibly occurring in unrecognized form.

So the pattern of acute infectious disease changes. The diseases of major importance in 1870 are today virtually extinct or at least brought under effective control. These have been those controllable through improvement in sanitation or through development of effective immunization. Certain respiratory-spread infections continue as prevalent as formerly but exact a lower toll of mortality. Meanwhile, new infections have appeared, either as importations or through recognition of types earlier overlooked, and are today attracting major attention.

Reprinted from

1870

EDITORIAL

In presenting to the Profession of the Northwest the first number of the "NORTHWESTERN MEDICAL AND SURGICAL JOURNAL," we can but ask a friendly forbearance in any criticisms to which we may lay ourselves liable. Dedicating our enterprise, as we have, to the medical interests of the Northwest, we shall labor faithfully for their advancement, without allowing or showing any sectional prejudice or favor.

Our columns will be open at any time to the Profession, and we sincerely hope that any physician will feel at liberty to write for our publication letters pointing out and correcting any violation of the code of ethics, or in any way correcting the tendency to charlatanism, which, to a certain extent, prevails in this State, as in all the newer, and some of the older, States of the Union.

The physicians of the Northwest can greatly aid us by securing for us subscriptions and advertisements, and by contributing medical notes and clinical reports. We are ready and willing to pay liberally for all worthy articles.

Making no promises for the future, except that we shall work faithfully for the best interests of our professional brethren, we submit our first number to their kindly notice.

Northwestern Medical and Surgical Journal 1:16, 1870

CASE OF RECTOCELE,

With the various operations for its cure, and their failure, when the radical operation for its entire removal was adopted, which leaves every prospect of complete success.

[Reported by Dr. MAYO, of Rochester, Minnesota, to the Northwestern Medical and Surgical Journal, and read by request at the semi-annual meeting of the State Medical Society at Minneapolis.]

During the fall of 1867, I was first called to see Mrs. H., who was supposed to have "falling of the womb," and to be suffering from all the sympathetic pains and derangements usually attending prolapsus of the uterus, but in a more aggravated form. This woman had been in Minnesota about one year; she came from the city of New York, where for several years before she had been under some physician's care.

Her first symptoms she could not describe very clearly, but she recollected that she "bloated a good deal," and suffered from continued headache; the pain mostly confined to the top and back of the head. She was always very costive; bowels moved only once in six or eight days; if oftener it was from the continued use of medicines. She thought her troubles were all caused by overtaxing her strength in lifting. She gave her reason for this; that one of her children had a fall which injured his spine, gradually producing a posterior sharp angular curve with great deformity, and ultimately death, while under my care. After the injury she was in the habit of carrying the little sufferer about with her, and often doing her work with him in her arms.

This was fourteen years ago, which gives us a date for the commencing of the pelvic change. Soon after this date she had continually to apply for medical aid. The first physician she applied to, told her she had falling of the womb, and introduced an instrument to keep it in place; by this treatment she was not benefitted, and went to other physicians; and by their

Eighty Years of Progress in Surgery

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The Journal-Lancet made its appearance as *The Medical and Surgical Journal* eighty years ago. And since 1881 the Journal has appeared regularly, first as a semimonthly magazine under the title of *Northwestern Lancet* and finally as a monthly periodical under the present title. The changes which have come into the world during this span of years, which are encompassed within one man's life, defy understanding and exceed on every score, save one, the wildest predictions of the rashest prophets. To this performance beyond prophecy, the developments in medicine and surgery have been no exception. Who, armed with the medical knowledge of 1870 and the most discerning vision of that time, could have envisioned the accomplishments of medicine of 1950? And if, in the art of living at peace with our fellowman, these 80 years could teach as important a lesson, what progress this era would symbolize! Even greater then would be the contribution of science and medicine because of the salvage of life and of property and money wasted in man's eternal struggle with his fellowman.

The mere cataloguing of disease had just begun in 1870. The birth of bacteriology opened up new vistas of investigation, brought unrecognized diseases into focus and unheard-of provinces of knowledge into being. It accelerated interest in pharmacology, a process which has continued with periodic peak-like thrusts even to the present day. All of this has increased the physician's usefulness to society and brought glory in the wake of healing.

Elective Surgery—A Product of Asepsis

Anesthesia was a great boon to the patient needing the attentions of a surgeon for an operation of necessity—such as amputation for a mangled or mortified leg, reduction of a dislocated joint, release of a strangulated hernia, removal of a vesical stone, or incision of an abscess. More frequent recourse of patients to relief through surgery came, however, only when asepsis made operations relatively free from the danger of inflammation. The early days of antiseptic surgery constituted a tremendous advance over the pre-antiseptic era in which no precautions were taken against wound sepsis. It remained for the scrubbing of the hands of the surgeon, the preparation of the patient's skin with antibacterial agents, the boiling of instruments and the autoclaving of linens, the wearing of gowns, gloves and masks by surgeons, nurses, attendants and spectators, to lessen the hazards of open wound surgery. Sterilization of the atmosphere of the operating room by the carbolic acid spray, upon which Lister placed so much emphasis, fell rather quickly into desuetude. Even the experience of 1950 teaches, however, that surgeons must not neglect this source of wound contamination which first absorbed the attention of Lister.

When surgeons learned that the precautionary asepsis largely did away with the grave hazards of wound suppuration, they began to include surgical attacks upon conditions which had defied them because of the risk involved. Diseases which had remained in the realm of pathological curiosities became the everyday concern of surgeons. Patients sought and obtained relief from conditions such as gallstones, intestinal obstructions, cancer of the bowel, hernia, urinary tract obstruction from prostatic hypertrophy and renal stone.

Over the subject of ovarian cysts, the validity of the entire thesis of antiseptic surgery seemed to be suspended, at least in the minds of some men, such as Lawson Tait. Affecting no interest in antiseptic surgery, he continued to insist that the bacterial concept of disease was simply a myth, and that his use of soap and water, and suction instead of sponges to provide a bloodless field, brought results in the extirpation of ovarian cysts that were at least as good as those of the ardent proponents of the antiseptic system. And strangely enough they were! All of which indicates there is much merit in soap and water.

Fortunately for surgery, most surgeons, save those near the origin of the controversy chose to ignore the issue. They had observed what antiseptic and later aseptic surgery could do and were convinced.

All earnest investigators, like seasoned mariners, must learn to accept opposition and to sublimate vexation to the more important task of keeping the direction of travel in view. If the emotional ballast of the investigator, in reaction to unpleasant circumstances, rolls a little off center, he may upset his own vessel. Lister's example in this regard merits the careful study of all who have an acquaintance with his work. However much they applaud his discovery, they will learn to admire Lister as a man even more.

Surgeons have learned that the way to meet controversalists of the Lawson Tait variety is through the agency of animal experimentation. If Lister had employed controlled laboratory experiments to prove his argument that suppuration in clean wounds could be averted by employment of the antiseptic principle the problem would have been settled definitely long years before. Although Lister visited this country in 1876 at the time of the Centennial, five years later, in 1881, when President Garfield was shot in Washington, there is no suggestion in the accounts of the management of his wound by the attendants that any of them even considered employment of Lister's antiseptic principles!

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Surgeons have been guilty too long of empiricism, and a more critical attitude is coming about. When will most surgeons stops to ask: what is the evidence that the procedure I propose to perform is good? When surgeons generally learn to view their own activities with a critical eye, surgery will have taken a significant step forward.

The public and physicians generally do not need to be persuaded of the value of research for there is evidence on every hand. And yet a minority group in our midst, while accepting all the benefactions of such research, continue to oppose animal experimentation and suggest that its discontinuance would not impede the progress of medicine. These same persons approve of the slaying of animals for food. What hypocrisy! Our society, in which they fortunately are a small minority, might well ask of them a sign consistent with their professions. Laws authorizing the performance of animal experiments are as necessary as the Anatomy Act. The people of Minnesota are anxious that its Medical Research Institutes have that privilege.

It is not the intent of the writer to delineate even the peaks of progress which have come about in surgery during the past 80 years. Substitution of the evidence supplied by experimentation and research for the empiricism of an earlier day has been the common denominator of most progress in surgery.

The antibiotics have given a tremendous impetus to all of medicine, which impress also has been felt keenly by surgery. It will have to remain for observers of the next generation to record whether antibiotics like anesthesia and asepsis, have been a primary factor in the advance of surgery. At the present time a large number of surgeons give antibiotics willy-nilly to all patients upon whom they operate. The years which lie ahead will undoubtbedly determine what should constitute standard practice in this regard. Certain it is, if a poll were taken now, most surgeons would concede that antibiotics belong in a triple A, together with anesthesia and asepsis.

In reviewing the accomplishments of surgery in the past two decades, one factor stands out prominently: the items important for the success of an operation are better evaluated now than they were 20 years ago. In other words, experience has taught us to appreciate and understand better than we did then the nature of the contribution of an item to the success of a procedure. Evidence and fact are replacing empiricism and opinion. When the *how* and *why* of a matter are disclosed, it becomes increasingly evident *what* is important.

To affect the role of an oracle beyond one's capacity to understand is to act the role of a hypocrite. Yes, we are asked many questions which present knowledge does not permit us to answer. But improvement of vision in certain areas has made it easier for us to admit our ignorance in those areas where our blind spots are broad.

OPERATIVE MORTALITY NO LONGER THE SURGEON'S PRIMARY CONCERN

Formidable operations are undertaken daily in clinics throughout the land which would have been considered miraculous if successftil 20 years ago. And why? Because of new developments? No, unless doing something better than it was done before is new. Anesthesia is much better, but many of us are relying largely on ether, the first anesthetic. The important thing is that anesthetists have learned and are continuing to learn how to keep patients asleep for long periods of time without great hazard to life. Is anesthesia an important factor of stress in operations? Are some anesthetics, on this score, better than others? Does anesthesia play an important role in the postoperative fatigue of patients? There is only one way to answer these questions, and that is, research.

The postoperative fatigue of patients is a question deserving serious study. All factors which contribute to the stress phenomena of operation need to be investigated. And when that knowledge can be woven into our practice, the convalescence of the patient may become as short as his hospital stay. Many postoperative complications are now avoided by eleminating the element of hurry in surgery and by a better appreciation on the part of the surgeon of the important features of the operation.

THE FUTURE OF SURGERY

The surgeon still has an important labor ahead of him in making the patient's postoperative recovery more pleasant. The anesthetist must learn to make even long periods of anesthesia simulate physiologic sleep; the surgeon must perform his operation so that nothing is left to chance. Then if the operating team of nurses, surgeons and anesthetists can learn to control pain and discomfort after operation, operations will be more readily accepted. The time may come when an operation may be wholly a pleasant experience. When the handicraft of surgery has moved forward to that extent the public, I feel certain, readily will reorient itself concerning its uneasiness over operations.

Every surgeon has experienced a greater willingness on the part of patients to accept operation as a remedy for ills not amenable to conservative management. Patients, as well as the operating surgeons, are constantly surprised by the ease with which substandard risk patients withstand trying operative procedures. The one stage operation for the multiphasic procedure is definitely here to stay and the limits of tolerance on this score have not been probed. Leaving nothing to chance in any of these component parts of the operation is the formula for success.

There have been prophets in the medical profession who have predicted decline and contraction of the field of surgery. You and I have heard such prophecies even from the lips of surgeons. The only contraction I can observe is the contracted vision of those who give voice to such oracular expressions. They say, soon we shall learn how to prevent or cure cancer. Yet, let us continue to hope so. But in the meantime, we must learn to ask of nature a large number of related questions, the integrated answer to which will help to decipher the enigma of cancer. Only persistent research for handles and research tools with which to make telling onslaughts on the problem can provide the answers to those questions. We must be realistic. Out of information concerning cancer now available, we must eke out every fact which will make the most of our therapeutic shortcomings. The facts are few but very clear: early cancer is difficult to diagnose and is curable, when the disease is local; late cancer is readily diagnosed but very difficult to cure by any means. In other words, until we learn how to prevent cancer or cure it by simple means, the only hope is early diagnosis. Moreover at any time, for most cancers, the treatment, early or late, is radical surgery. Such treatment, carried out when the disease is still local and before lymph nodes are involved, succeeds in curing a high proportion of all cancers. Unfortunately, most cancers are silent so long that when the diagnosis is established, the lymph nodes are usually involved. There is good reason to believe that when patients report for the treatment of a gastric cancer because of symptoms, the cancer has been there approximately two years. And this occurrence is probably true of most visceral cancers. Concentration of efforts directed at early detection of cancer is therefore a matter of public trust. At the same time, the surgeon must double his efforts to do something better for the patient with lymph node involvement. Our experience with re-entry after an interval of four to six months for a "second look" into the abdomen of patients having cancer of the stomach, colon or rectum with lymph node involvement suggests definitely that the reason we fail to cure such cancers is because cancer is left at the first operation. I believe that a number of such persons will ultimately show up on the list of cured cancer patients.

Does our duty end there? I do not think so. Over a period of several years, excision of visceral cancers in the presence of liver metastases has been practiced in this clinic. Moreover, small areas of metastases in the liver also have been excised over this same period of time. During the past year, however, more aggressive attacks have been made upon hepatic metastases. By placing clips temporarily upon the hepatic and superior mesenteric arteries and the portal vein, it is possible to create a bloodless field permitting virtual total excision of even the right lobe of the liver. We need to know how long the hepatic artery may be compressed without inducing undesirable side effects upon the residual liver tissue or kidney. I believe it is safe to say that the liver will grow faster than cancer. The primary problem is not operative mortality; but will such heroic efforts cure cancer? I do not know, although one thing is certain, that in suitable cases such measures hold out at least some satisfying promise. That is more than can be said of most chemotherapeutic agents now undergoing clinical trial.

I say all this here only to suggest that presently an expansion of the number of surgical beds for the care of cancer patients will probably be necessary in order that ultimate cure can be promised a larger number of cancer sufferers.

Let those who predict the contraction of the field of surgery contemplate also the great expansion in the past decade in surgery for lesions of the lung and esophagus, and now for surgery of the heart and its large vessels. And whether or not physicians learn presently how to prevent rheumatic fever, surgeons must and will learn how to correct valve defects.

A Glance Out the Study Window

As I look out of the window of my study, I see many changes for the better which have come about on the settee of Medical School faculties during the past eighty years. The bench has been lengthened several times to accommodate new professors, who, like sitting-hens on their accountable eggs, have ensconced themselves comfortably in the brooder where medical ideas and policies are hatched. Moreover, the settee has been reupholstered on occasions to modernize the seat as well as to make it more comfortable. Some of the professors have found the couch so easing to the monotony and strains of life that only with difficulty are they able to restrain themselves from falling asleep; some have abandoned that struggle altogether.

The majority of the professors, however, are as wide-awake as ever they have been during the long history of medical education. The team spirit pervades their discussions more now, I am inclined to believe, than in earlier days. Their multiple duties of teaching and research, for some of them the care of patients, the demands of their respective offices and laboratories, the frequent counsels of faculty meetings and committees, have limited the activities of almost all the professors, who take their teaching duties seriously, to the confines of the Medical School campus. Their concentration of interest has helped build the competence and morale of Medical School faculties. In consequence, some of these professors have been bold enough to suggest that the day may not be far off, even in universities, when the medical professors may be admitted without special recommendation or hand engraved calling cards to the sanctum sanctorum of scientific gatherings. On that score, let it only be said: recognition must be deserved; it cannot be commanded.

The faculty of the Medical School is one large happy family, but as in most families, there is occasionally a knotty problem or two which cannot be resolved completely in the council gatherings. In consequence of the frequency with which the partition of professorial opportunity must be decided by the Dean, the approach to the threshold of the Pater-Familias grows a bit worn. Sometimes, I presume his temper does too. But he and his colleagues know that one of the qualities which singled him out for this high but thankless office is the sphinx-like reaction with which he is able to meet every suggestion, no matter how disturbing. The rapidity of growth of the family (planned parenthood not yet being subscribed to by all medical faculties), lack of adequate housing facilities (office laboratory and hospital), increasing costs and a number of other equally disturbing items have made the Dean's problems real ones. Little wonder that he must find escape and consolation in the circumstance that other Deans are beset by the very same problems!

Because of all this, it has not been possible to modernize either the complexion of the faculty nor the curriculum completely. Vestiges of old historical relationships are still in evidence here and there. One of these which affects the role of the surgeon with reference to his professorial duties is the traditional background of the surgeon. All surgeons who believe in looking at the patient as a whole have put off the short robe. Many of the difficulties between physicians and surgeons chronicled in the annals of the past have been patched up by the friendly gesture of physicians (internists and pediatrists) investing themselves in the long white robe of the surgeon as they make their ward rounds. In fact, it is no longer possible to distinguish a physician from a surgeon by appearances. Sometimes even the surgeon's talk about a condition such as heart disease may beguile one into thinking he may be listening to an erudite physician. Nowadays, it is largely on matters of advice given patients, and the character of the problems which fill their minds, that the distinction between physicians and surgeons must be drawn. Surgeons are heard to say: Well, what can be done about all this? Physicians are wont to say: Let us wait and see.

The complaint of surgeons in some university clinics is that, whereas exchanges of opinion in discussions are open and free, nevertheless with reference to patient-care, here and there still remain a few traces of the paternalistic attitude of physicians toward surgeons. I do not believe it would take a topflight representative of the F.B.I. to uncover some of these reminders of the unpleasant medieval relationships between medicine and surgery, when physicians found it necessary to guide the hand of the surgeon. The time is overdue when the surgeon in all spheres of his active interests must have under his direct control a few beds for exploratory pursuits, even though that interest may conflict with what has been regarded as the traditional heritage of the physician. Is not such an arrangement in the best interests of greater medicine? It certainly is in the interest of the patient and the public. And whose concern is paramount in this controversy?

Let no one be guilty of willful blindness in so important a matter; it is easily the worst of all deadly sins, because it argues a self-sufficiency and confidence in one's own opinion which cannot be condoned. If there be anyone on the professorial settee possessed by such blindness that he remains deaf to earnest pleas of his fellows, let him repent before it is too late. He has excluded the light of understanding from his soul and should implore the mercy of Heaven, for his colleagues can never forgive him. All of us are continuously at school in the University of Experience; and of all the schools in the world, its tuition fees are the highest. For him who cannot learn in this school, there is no hope.

Confession is necessary for ablution of sins. The physician is giving up his speculative rationalization, the surgeon his empiricism. During the withdrawal both are finding consolation in research. Let us hope that each continues to comfort the other and finds in research the refreshment, satisfaction and solace which it has brought to all of us in our individual lives.

DIFFERENCES IN POINT OF VIEW

The prolific nature of the medical sciences, both in the laboratory and in the hospital, has brought new provinces of knowledge and practice into being. The poor Dean, of course, has to affect some semblance of recognizing these new professional units and duties. Neither he nor his professors, who have sat about the faculty meeting table the longest, can be wholly deaf to the urgent pleas of these earnest and enthusiastic fellows. In consequence, a rather difficult problem has arisen in many faculties. Those who have long occupied the settees know their place and do not want to move over. The faculty meeting table is not large enough to move up additional settees; the new entries therefore are obliged to take a seat in the second circle or to look for standing room in the rear.

Following one of these faculty meetings, not so long ago, I overheard a discussion which I will try to repeat as it occurred.

Old Professor: These meetings are getting a bit crowded.

New Professor: Why not find a larger meeting place?

Old Professor: That isn't so easy, you know, old boy; anyhow, as long as the settees and table hold together, I think we should continue just as we have these many years. Why set aside the sacred atmosphere of tradition?

New Professor: I wonder if there is any distinction between the angels in Heaven?

Old Professor: Why do you say that? Well, when I come to think of it, I should think there might well be. No enslaved class here, you know, ever asked for or got complete liberty at once. Do you think it would be different there?

New Professor: Well, I would like to think there is some place in this or any world where a fellow with a good idea could get on.

Old Professor: Why, don't tell me! You have a new idea?

New Professor (unable longer to control rising anger): Yes, that is just the trouble with you old wiseacres. You think you created all knowledge, when as a matter of fact you are just a bunch of old sponges.

Old Professor: Young man, do you know what you are saying?

New Professor: Yes, I do, and you have heard nothing yet. You listen to me for once. This old world is moving on and you better get on the band wagon or you will be moved out of the way or left behind.

Old Professor: What do you mean?

New Professor: I mean just this. You old fellows both stand and sit on your dignity. And let me tell you: Pride may puff a man up but it cannot prop him up. Unless you get off those stilts, you will fall and break your lordly neck. How do you expect to understand what you see from that elevated position when you don't begin to understand what is going on around you?

Old Professor: Young man, it seems to me you have said about enough for one day.

New Professor: Why, I have just begun.

Old Professor: What do you want? What are you trying to say?

New Professor: Just this.

Old Professor: Be specific. It is late, and I think it is about time for you to go home and think over some of your rash statements. I hope that by morning you will be around to apologize.

New Professor: I am sorry if I have offended you. You have been good enough to listen; moreover, you have asked me to be specific and I would like to get this off my chest now that the ice has been broken.

Old Professor: Well, make it brief.

New Professor: My complaint is that you first-line professors refuse to open your hearts and give us new boys a chance in what you regard as your field.

Old Professor: Get to the point! What are you driving at?

New Professor: Well, take for instance the chapter of heart disease. I would like to————

Old Professor: Young man, you have said enough. You will be lucky if you continue to hold your seat in the faculty. Why, to think of it! Heart disease has been my domain and that of my predecessors for uncounted centuries. And now you, young upstart, want to come here and tell me what to do about my own field that you know nothing about.

New Professor: That is just the trouble; I know more about it than you think I do.

Old Professor: To think that I should ever live to be so insulted! Take your trouble to the Dean, young man. I will have nothing more to do with you.

New Professor: Oh, come on. We are just beginning to get somewhere in this discussion. I think if we had the chance to talk this over for an hour or two, you might even see my point of view.

Old Professor: Never!

New Professor: The light is on in the Dean's office. Let us make an appointment to talk this over with him.

Old Professor: You can talk to him as much as you like. I am holding my ground. If the Dean wants me, he can send for me.

New Professor (calling in through the Dean's door to the secretary): Is the Dean in?

Dean's Secretary: No. The faculty meeting unnerved him. He left town and has gone to his hideout, whether to Washington or the country, I don't know. He seemed pretty tired out. I hope he gets a good rest. If he doesn't, he will not last long.

Old Professor: Well, that settles that!

New Professor: It does nothing of the kind. I will take it up with the Dean when he gets back.

Dean's Secretary: Yes, that's the trouble. No wonder he has to get away. I am going home myself. Good night, gentlemen.

Conversations and discussions very much like the above are always in ferment in the faculty. Usually, however, the New Professor, like most of us, wanting a sympathetic audience for his ideas, addresses himself to his own immediate colleagues, who, of course, share his views completely. A man who has risen to the office (high or low is a matter of divided opinion) of professor wishes to realize the full potentialities of the available opportunities, not so much for himself as for the activity he represents. It is not so much a craving for approval that he desires as the privilege to exercise all his ingenuity in making the most of his opportunity. This is a laudable objective, from everyone's point of view, save the one who feels that he or his activity may suffer from the "grandiose" ideas of the New Professor.

The whole world of ideas has been advanced by such struggles, whether in the competition for the sale of butter and oleomargarine or in the endeavors of "old and new professors" to extend their areas of usefulness. And in any such altercation, on any matter, anywhere, one might call the Old Professor, convention, and the New Professor, novel endeavor. Immediately, the stage is set for the type of debate we have just listened to. And in the arena of ideas, that which is of most value to society as a whole, in the end comes out on top; but as in most gladiatorial contests, in which the participants are fairly evenly matched, either contestant may be on his back before the fray is over.

The debate between the Old and the New Professor is going on continuously. In medical schools in which advances are being made, the voice of the New Professor gets an attentive hearing. The Old Professor is inclined to scoff at the entreaties of the New Professor by labeling them pretentious and visionary. He may even see fit to comment upon his opponent in the controversy by the use of such unpleasant words as ambitious or power-seeker. The Old Professor knows very well that these are illegal blows in all bouts governed by the rules of Marquis of Queensberry. Like every defense counsel, however, he is not above employing any antics which may help his case with the jury.

The sound new professor in these controversies does not seek power; he disavows any pretense at empire building. He simply wants an opportunity to implement exploratory studies and the chance to attack an old problem in an original way. Let us cheer him on in this struggle. Our own welfare depends in part on the information which he may bring to illuminate difficult and obscure subjects.

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Reprinted from
1870

CONGENITAL BLINDNESS, OPTHALMIA NEONATORUM, CAUSES, TREATMENT AND SEQUENCES.

BY M. C. WOODWORTH, M. D., ST. PAUL, MINN., LATE PROF. OF OPTHALMOLOGY AND OPERATIVE SURGERY IN CLEVELAND MEDICAL COLLEGE.

That there are occasionally cases of congenital blindness no one can doubt, but I am inclined to the belief that in a very large majority of cases, persons who are said to have been born blind have lost their sight after birth.

I have spent no little time in making inquiry into the relative frequency of congenital defects of vision, and blindness, induced by the opthalmia of newly-born infants.

In the year 1868 I noted 28 cases of persons thought to have been born blind. I found, upon close inquiry, that 19 out of that number, shortly after birth suffered from sore eyes, which in all probability was the cause of their loss of sight, rather than congenital defect. Of the remaining nine cases, two were cases of remaining Membrana Papillaris, and the other seven cataract. I was able and did afford perfect relief; with the exception of one of the cases of cataract, of which one eye was attacked by iriditis and was destroyed after operation for the cataract. The three cases of imperfect retina and optic nerve were the only ones that I considered irremediable cases of congenital blindness out of the 28, or a little less than 11 per cent. of cases which were totally without hope of remedy. If we take all the cases that were purely congenital, we have a little less than forty-eight per cent. which were from disease during fœtal life. As a matter of course these operations are, from a limited number of cases, picked up here and there, and therefore the calculation can be only approximative, but from the observations of others who have given this subject attention, and my own experience, I incline to the opinion I at first expressed, namely, that a majority of the cases which are said to have been born blind, or naturally blind, are the result of Opthalmia Neonatorum rather than congenital defects in the visual organs.

Now, if this proposition be only approximatively correct, the early detection and prompt treatment of the malady is a matter of no mean importance to the physician, and especially is it of importance to the friends and the little sufferer himself. In ordinary practice our attention is only now and then turned to this subject, but if we could get a summary view, and see at a single glance the thousands who are groping their way through this world in midnight darkness, we would be impressed with the necessity of constant care and watchfulness on the part of him who has assumed to look after the well being of the little adventurer into this world, and who is in constant danger of

M. C. Woodworth, Pioneer Eye Specialist

Frank E. Burch, M.D.
St. Paul, Minnesota

One cannot read Dr. Woodworth's remarkable contribution without realizing its historical significance. So far as investigation permits, its author was undoubtedly the first practicing ophthalmologist in Minnesota; his was the first published contribution to the subject of ophthalmology. Above all, it was the first early attempt to emphasize the importance of a phase of preventive medicine hitherto largely neglected; namely, *prevention* of blindnss. It was a forceful appeal to general practitioners to awaken to the need of greater care in diagnosis, prompt recognition of etiology and common-sense therapy against the most important cause of blindness at that time.

Ware, some seventy-five years previously, had proved that ophthalmia neonatorum was definitely caused by venereal infection during birth although the exact bacteriologic agent was not known until Neisser's discovery of the gonococcus, published in 1879.

At the beginning of the nineteenth century, fully half of all blindness in Europe was caused by eye infections following birth. Soon after the opening of the School for the Blind at Faribault in 1866, with two boys and two girls in attendance, it was realized that the cause of blindness was predominately from infection; in fact, admissions from this cause, before the State Board of Health enforced the silver nitrate regulation, was 28 per cent, approximately the national average. Thanks to wise legislation and its continuous enforcement by the Minnesota Board of Health, compelling the instillation of 1 per cent silver nitrate in the eyes of the newborn at birth, by either doctors or midwives, the incidence of visual impairment from this cause has rapidly diminished until today there is only one child in attendance with a diagnosis of ophthalmia neonatorum. In our University clinics it has become exceedingly difficult to obtain an infant case for demonstration to our medical students. Although our author did not know of the Crede prophylaxis, which was not published until 12 years later, or of the renowned Professor Ernest Fuchs' prize thesis on Prevention of Blindness which appeared soon afterwards, he advocated the recognized need of such precautionary measures as were practical at the time. He could not have known much about the real action of antiseptics, living as he did when medicine had just begun to appreciate the epochal work of Semmelweis, Pasteur and Lister. Condemning the use of solutions of corrosive sublimate and mineral acids, crayon of cupri sulphas, argenti nitras, with special disapproval of plumbi acetas, then so indiscriminately used and abused, Dr. Woodworth urged the need of frequent and copious irrigation, rather than drastic use of antiseptics.

One cannot help wondering, in view of the limitations of the existing opportunities for medical education during his time, just what sort of background Dr. Milton Case Woodworth could have had for training in the practice of ophthalmology. This special field of practice had only begun to be recognized as a specialty. During that period it was not unusual for general practitioners to engage in an announced "specialty". Because of the meager facilities for apprenticeship training then existing, it may be inferred that Dr. Woodworth followed the customary practice of that time. There is no mention in the history obtainable of his ophthalmic studies or special preparation for his announced specialized practice.

Dr. Milton Case Woodworth was born in Casenovia, New York, October 28, 1832, moving with his parents to Windham, Ohio, in 1836. He was graduated from the University of Michigan in 1857, first practiced medicine at Newton Falls, Ohio, then at Warren, Ohio. At the declaration of war, 1861, he enlisted as a private soldier and after a few weeks was appointed surgeon of the 51st Ohio Volunteer Infantry. He served during the entire war, for the most part with the Army of the Cumberland and the Army of the Tennessee. He was made brigade surgeon, division surgeon, served as medical director of the post of Murfreesboro after the battle of Stone River and took charge of the general field hospital at the battle of Atlanta. In 1865 he was appointed assistant surgeon in the regular army and visited officially many of the important military stations of the northwest.

He returned to Warren after war and was a member of the Ohio State Medical Association in 1866. He was Demonstrator of Operative Surgery in the Cleveland Medical College, 1865 to 1867, and Professor of Ophthalmology, 1867 to 1869. This college was afterward merged with Western Reserve University.

In 1869 he moved to St. Paul, where he practiced until 1873. He is listed as a member of the Minnesota State Medical Society for 1871-1873. In the early numbers of the *Northwestern Medical and Surgical Journal*, there appears the following advertisement:

EYE AND EAR INFIRMARY
St. Paul
Corner of Third and Jackson Streets
M. C. Woodworth, M.D.
Late Professor of Ophthalmology in the
Cleveland Medical College

Dr. Woodworth left St. Paul in 1873 and engaged in the general practice of medicine at Ellsworth, Wisconsin. His first wife, Mary E. Perkins of Ohio, had died in 1860, and their only child, a daughter, died in infancy. In 1874 he married Lizzie Bradley of River

Falls, but they had no children. He died in Ellsworth in 1897.

What sources of ophthalmic literature were available to the author at that time were, for the most part, American editions by English writers: Portefield, Travers, Ware, Gibson, Lawrence, J. Sohlberg Wells, Wharton Jones and especially the monumental classic by MacKenzie. There were no ophthalmic journals in English, the American Ophthalmologic Society had just been organized (1864), and the first volume of the American Archives of Ophthalmology only recently published. Occasional ophthalmic articles were published in the American Association for Natural Sciences' periodical.

The author lived during the great transition era of ophthalmology when it was becoming first recognized as a specialty: Helmholz' ophthalmoscope was coming into use, Donders' valued work on refraction and the methods of correction of astigmatism had just been translated (1870), and Agnew's published (1866) operation for advancement in strabismus was still under trial.

What remarkable opportunities we enjoy today in contrast to eighty years ago! Dr. Woodworth wrote of his operations for congenital cataract and success in 6 of the 7 cases, almost as good an average as attainable today. He, of course, employed general anesthesia, if any, and without the rigorous antiseptic precautions currently in use. Cocaine anesthesia did not appear until 1882.

What a Rip Van Winkle awakening would this author experience could he return and witness the new additions to our diagnostic armamentarium, in bacteriology, hematology, and other pathogenetic means of differential diagnosis. In addition to self-illuminated ophthalmoscopes, we have the corneal microscope with slit lamp, the tonometer, perimeter, x-rays and innumerable physical and mechanical aids. Skiascopy enables us to obtain quite perfect results in refraction and the optician's art is well nigh perfect.

Surgical therapy has undergone refinements in antisepsis and sterilization, the use of prophylactic measures against infections, undreamed of a few decades ago. Measures for control of glaucoma, improved technique for cataract surgery, refined methods of application for correcting ocular muscle anomalies, the use of the electric magnet for removal of penetrating steel foreign bodies within the eye, diathermic "spot welding" for retinal detachments, and corneal transplants for obstructing corneal opacities—these are only the high spots of surgical progress in our field. The medicinal aids afforded through correction of thyroid dysfunction, the use of vitamins, the antibactericides and antibiotics, insulin and other research products of biochemistry, are only a few of our present day miracle aids.

Physical contributions to the field of therapy for eye pathology are manifold: x-ray and radium for malignancy, heliotherapy and actinic measures, the use of heat and cold, physiotherapy in many forms, all add up to enormous means for meeting the therapeutic problems of ophthalmology in addition to the contributions from other branches of medicine and surgery. Therapy has by no means remained static. Constant new discoveries and additions are being added.

One of the most important changes that has taken place is in the education and training of the ophthalmologist. A prolonged basic training in medicine, preceding special internship or apprenticeship training for ophthalmic practice, with final certification by the National Board for Ophthalmology, are required for recognition and acceptance of the ophthalmologist by his professional colleagues or the public. Existing evolutionary changes in the training of the specialist of today have come about through the enormous discoveries in all the correlated fields of science, as well as in the fields of specialized medicine, and they are progressive.

One can only feel that Dr. Milton Case Woodworth was fully abreast of, if not somewhat ahead of, his time. One must credit him with real literary talent, remarkable skill and foresight, and character, looking forward to practical advancement of his specialty as a tool for human betterment.

EIGHTY YEARS OF PROGRESS IN SURGERY—

(Continued from page 77)

GENERAL PRACTICE 80 YEARS HENCE

And what of the general practitioner of the future? It is a difficult question. On every hand, we find words of high praise spoken in his behalf which fall gently on all ears. Much of this, however, as far as I can determine, is lip service. Hospitals debate what privileges they should accord him. Medical schools have made no place for him on their faculties or hospital staffs. If voluntary hospitals, in connection with medical schools in metropolitan areas, develop programs of graduate training and research, making it possible for graduate students in all the specialties of medicine and surgery to qualify fully for the board of their specialty, the opportunities for graduate training would be increased manyfold. Such a development might eventually bring within the reach of every community a clinic staffed by well-trained and competent specialists. The clinic idea, to which the Brothers Mayo lent such great impetus, might well become the standard condition of practice everywhere in this country. And would the public or the general practitioner mind? I do not know. Satisfying conditions of work constitute the best source of emolument in the minds of many men. I am inclined to believe that the idea might find acceptance with both the public and the general practitioner. To use a frequent phrase of physicians: Let us wait and see.

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Osteitis Condensans Ilii

*The Possible Relationship to Juvenile Epiphysitis**

Walter H. Ude, M.D.†
Minneapolis, Minnesota

Editor's Note: *Osteitis condensans ilii is recognized only when seen on roentgen films. For a long time subsequent to 1896, films were not extensively used and the majority of those employed were of poor quality. With the present, almost universal use of x-ray films, their technical excellence and their interpretation by highly trained roentgenologists, one important discovery after another has been announced. Thus, in its 80th year and 54 years after discovery of the x-ray, the* Journal-Lancet *traditionally presents new thoughts and observations—this time on the etiology of osteitis condensans ilii.*

Osteitis condensans ilii is a condition which is recognized only when seen on roentgen films. It is characterized by a localized calcium condensation in the ilium directly adjacent to the sacro-iliac joint, without any demonstrable pathologic changes in the joint or in the adjacent border of the sacrum. In a minimal degree of involvement it may be limited to the lower portion of the auricular process of one ilium. In the more marked cases it extends along the entire vertical diameter of the auricular processes of both ilia and flares laterally into the adjacent bone. It occurs predominantly in women and is usually discovered between the ages of 20 and 40.

Hare and Haggart[1] reviewed the subject in 1945 and reported 23 patients observed in their clinic. Their youngest patient was 23 years of age. They quote Rendich and Shapiro, who were able to secure a biopsy study during the performance of surgical fusion of the joint. This biopsy revealed what appeared to be a non-inflammatory calcium condensation in the osseous tissue with obliteration of the evident former lacunae. They were not able to clarify the etiology of the condition. All of their patients came for examination because of low back pain. In some instances the pain radiates downward into the lower extremities and may simulate herniated disk. Pain may be localized to the lumbar region and not to the region of the sacro-iliac joint.

Since the etiology of this condition is still unknown, any other pathologic processes observed in these patients should be of interest. With this in mind, a group of six cases recently observed by us is herewith described, mainly from the roentgenologic standpoint.

We have observed simultaneous presence of the residual changes, and the sequelae, of vertebral epiphysitis (Scheuermann's Disease) in these cases of osteitis condensans ilii, and this has led us to the thought that there may be a close relationship between the two conditions. We are considering the possibility that the findings in the ilia are secondary sclerosing changes superimposed on structural deformities which have resulted from a localized epiphysitis of the sacro-iliac joints, occurring simultaneously with the disease in the spine. We are also aware of the possibility that the sclerosing changes in the sacro-iliac joints might be secondary to the changes in the directional strain placed on these joints by variations in the curvatures of the spine produced by the vertebral epiphysitis. Whether other explanations can be made in the light of the simultaneous occurrence of these two processes may be clarified by detailed study of larger groups of cases. The predominence of osteitis condensans ilii in the female must also be coordinated with these findings.

The roentgenologic features of vertebral epiphysitis have been described by de Lorimier[2] and others. The demonstrable abnormalities seen immediately subsequent to the termination of the active stage of the disease consist mainly of structural changes in the shapes of the vertebral bodies, with a tendency toward wedge-shaped compressions, intra-osseous herniations of nuclei pulposi, or so-called Schmorl's nodes, and irregular cortical sclerosing changes around the margins of the vertebral bodies and of the margins of the Schmorl's nodes. These changes produce variations in the curvatures of the spine, mainly kyphosis, but also scoliosis, which is distinctly localized to the region involved. Slight narrowing of the intervertebral disks may be present, probably as an associated result of the Schmorl's nodes. In subsequent years degenerative changes develop in the involved areas of the spine which consist mainly of hypertrophic marginal lipping. This begins to be in evidence in the third decade of life, considerably earlier than in the normal. In our observations there is also a gradually increasing degenerative change in the intervertebral disks as shown by further narrowing of the disks. Our youngest patient, aged 26, showed definite hypertrophic lipping although she presented relatively minimal structural changes of the vertebral bodies. In later years, cortical sclerosing changes somewhat like those in the ilii may develop in the margins of the vertebral bodies. It is assumed that all of these degenerative changes superimposed on the structural changes are due to faulty statics and are on the same basis as the degenerative findings seen in the hip joint subsequent to juvenile epiphysitis.

Case Reports

Case 1. V.P., female, single, age 26. Osteitis condensans ilii is present but involves only the right side and at this time is limited mainly to the lower half of the auricular process of the right ilium. The right sacro-iliac joint space seems to be slightly narrower than the left. The dorsal spine shows minimal structural variations of the vertebral bodies with slight tendency toward wedge-shaped deformities and with minimal but definite hypertrophic lipping. There are no Schmorl's nodes. There is a slight increase in the dorsal curvature of the involved region of the spine.

---

*From the offices of Drs. Ude, Borman and Ahern.

†Associate Clinical Professor, University of Minnesota.

Case 2. H.P., female, married, two children, age 31. Osteitis condensans ilii is present bilaterally and involves the entire vertical diameter of the auricular surfaces of both ilia. There are slight cystic and sclerosing changes in the bodies of both pubic bones adjacent to the symphysis pubis. There are moderate structural changes in the dorsal vertebral bodies with marginal irregular sclerosing changes, especially in the lower dorsal region, and hypertrophic lipping of minimal degree in the mid dorsal to moderate degree in the lower dorsal area. The intervertebral disks show moderate degenerative changes. There is a moderate increase in the dorsal curvature of this region of the spine. The lumbar spine shows a slight scoliosis with slight structural variations. There are no definite Schmorl's nodes.

Case 3. J.K., female, married, age 36. Osteitis condensans ilii is present bilaterally, involving mainly the lower half of both areas. The dorsal spine shows fairly marked structural changes with moderate wedge-shaped deformities of the vertebral bodies, fairly marked hypertrophic lipping, numerous Schmorl's nodes, moderate narrowing of the intervertebral disks of the mid dorsal area, and moderate kyphosis. The upper anterior portion of the third lumbar vertebral body shows a sclerosing change similar to that in the ilia.

Case 4. C.R., female, single, age 38. Osteitis condensans ilii is present bilaterally in a fairly marked degree. The dorsal spine shows a moderate structural change of the vertebral bodies, with wedge-shaped deformities, hypertrophic lipping, some degenerative changes of the intervertebral disks, and a moderate dorsal kyphosis. Schmorl's nodes are present. The lumbar spine shows a slight scoliosis.

Case 5. A.T., male, age 55. Osteitis condensans ilii is present bilaterally with a moderate degree of involvement. There are degenerative and sclerosing changes of both pubic bodies adjacent to the symphysis. The dorsal spine shows fairly marked structural changes with moderate degenerative changes in the intervertebral disks, marked hypertrophic lipping and moderate dorsal kyphosis. The lumbar spine also shows some structural changes with fairly marked hypertrophic lipping. Schmorl's nodes are present.

Case 6. M.H., female, married, age 66. Osteitis condensans ilii is present bilaterally in a moderate degree. Both pubic bones show destructive and marked sclerosing changes adjacent to the symphysis with narrowing of the symphysis and marginal hypertrophic changes. The dorsal spine shows marked structural changes of the vertebral bodies, marked hypertrophic lipping, degenerative changes in the disks, dorsal kyphosis and sclerosing changes covering the anterior portions of several of the mid dorsal vertebral bodies, not unlike the changes in the ilia. Schmorl's nodes are present. The structural changes are fairly characteristic of those residual from juvenile epiphysitis and are not those of senile osteoporosis commonly seen in this age of individual. There is, incidentally, also an old cystic necrosis of the head of the left femur, following intertrochanteric fracture, with secondary degenerative arthritis of the hip joint.

SUMMARY

1. Six cases of osteitis condensans ilii are briefly reported with reference to the roentgenologic changes in the pelvis and in the dorsal and lumbar regions of the spine. Five of the individuals were females and one was a male. The age range was from 26 to 66 years. Two of the females were single and three were married.

2. All six cases had changes in the spine consistent with those residual from juvenile epiphysitis and the sequelae of this condition.

3. Three of the cases had an associated degenerative process in the region of the pubic symphysis.

4. The condensing osteitis was unilateral in the youngest patient of this group and here there was evidence of narrowing of the involved sacro-iliac joint. This casts doubt on the supposition that condensing osteitis is not associated with joint involvement and might suggest that this contention has been made on the observation of cases with only bilateral involvement where both joints show identical changes.

5. It has been established that epiphyseal growth centers are present during the growth period on the auricular processes of the ilia,[3] although they are not described in all anatomy textbooks.

6. Since the etiology of osteitis condensans ilii is still obscure, the simultaneous presence of this condition with vertebral epiphysitis suggests the possibility of a common etiological factor. The immediate impression is that the first condition represents secondary sclerosing changes superimposed on juvenile epiphysitis of the sacro-iliac joints. It would be comparable to the changes which develop in any weight-bearing joint where the joint structures have been altered by a disease process.

It is hoped that this report will stimulate other investigators to review their cases of osteitis condensans ilii so that the significance of this condition may be more adequately established.

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Northwestern Surgical and Medical Journal 1:132, 1870

The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatric Society

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Editorials

AN EIGHTY-YEAR PERSPECTIVE

When the first issue of this journal was published in June, 1870, there was no school of medicine, nursing or veterinary medicine in what is now the Upper Midwest. In Minnesota the practice of medicine had begun in 1841 when Dr. Christopher Carli of Germany opened an office at the present site of Stillwater. In 1853 there were 20, in 1870, 212, of whom only 119 were legally qualified, and now there are 5,661 physicians licensed to practice in Minnesota.

Epidemics of contagious diseases and numerous other ills of people as well as those of domestic animals demanded the services of many trained persons in human and veterinary medicine. Those legally practicing their professions had been educated elsewhere, although from the 1840s to the 1870s the preceptor system of medical education was in vogue. The practitioner of medicine chose a pupil who, by working in his office, reading his books, making house calls, etc., became qualified to practice. While a few private medical schools were established—the first in 1871—it was not until 1883 that the University of Minnesota created a department of medicine and a teaching faculty of 29 members was appointed in 1888. Since 1908 the University has operated the only medical school in Minnesota. It now has more than 540 faculty members of the rank of instructor or above. The Mayo Foundation for Medical Education and Research was established in 1915 and the Center for Continuation Study in 1937.

The first school of nursing was opened at Northwestern Hospital in Minneapolis in 1881. There are now more than 25 such schools and fine nursing organizations are in operation, with over 10,000 currently registered nurses in the state.

Medical social work, instituted in 1915, is now extensively practiced. A medical social work course was first offered at the University of Minnesota in 1928.

A veterinary division was established in the University School of Agriculture in 1893, and a school of veterinary medicine in 1947. A state veterinary medical society was organized in 1897, and the Livestock Sanitary Board in 1903. There are now about 420 veterinarians in Minnesota. Members of this profession deserve much of the credit for the control of diseases of people and animals.

Although a medical society was organized in 1853, physicians felt the need of a state board of health to control contagious diseases and improve public health. They prepared a bill which was passed by the legislature on March 4, 1872. This was the third State Board of Health in the United States, having been preceded by Massachusetts and California in 1869 and 1871 respectively. The members of the newly appointed Board of Health were practicing physicians who proceeded to help their fellow practitioners control epidemics, etc. This board has maintained high standards and is rated as one of the best in America. It now operates eight district health units at strategic points throughout the state.

Contagious diseases such as smallpox, diphtheria, typhoid fever, the common cold and its complications, diarrheal diseases of children, pneumonia and tuberculosis were prevalent. In 1870, more than 13 per cent of all deaths were due to consumption. In 1883, there were 11,678 deaths from all causes in Minnesota. Diphtheria took first place with 1,374 deaths, and tuberculosis second with 1,079. Dr. W. J. Mayo stated (1894) that tuberculosis in its many forms and in combination with other kinds of infection caused nearly one-third of the annual death rate. Diarrheal diseases of babies and young children were rife and highly fatal. As late as the period 1909-13, this condition took the lives of 6,167 babies in Minnesota.

Prior to the 20th century, most physicians conducted individual practices. Dr. W. W. Mayo began to practice in Minnesota in 1855. When his sons, W. J. and C. H., graduated in medicine in 1883 and 1888, respectively, the three worked together. The demand for their services required employment of others to assist them. Soon patients and referring physicians designated this organization as the Mayo Clinic, and by 1905 it was known everywhere by that name. It has become the world's most outstanding clinic, receiving patients from every corner of the earth. While other groups have organized private clinics in all of the larger and some of the smaller cities, many physicians now conduct individual practices.

On several occasions the medical profession has been burdened by unnecessary health problems and the citizenry has suffered great loss because uninformed or misinformed persons, mostly without medical training, have initiated and promoted health projects with little or no medical approval. These can become extremely serious when contagion is involved. For example, from about 1850 to 1875 persons with consumption in Europe, New England and elsewhere were invited largely by nonmedical individuals and organizations to settle in Minnesota because the climate was thought to have a curative effect on this disease. This was recognized by the medical profession as a serious error and later numerous protests were registered. Again in 1942, a few individuals invited poliomyelitis victims from various parts of the world to be treated in Minneapolis. Members of the medical profession protested on various grounds, including the dangers of introducing contagion unnecessarily. It was not long until more cases of poliomyelitis were reported among Minnesota citizens than at any previous time; in fact, three of the most extensive epidemics in the state's history occurred in 1946, 1948 and 1949. The highest number of cases—2,881—were reported in 1946. The largest number reported in any previous year was 955, in 1925.

Despite the claims made for Minnesota's climate in the treatment of consumption, it possessed nothing that was not to be found in numerous places in various parts of the world. Despite the claims made for the treatment of poliomyelitis in Minneapolis, it offered nothing more efficacious than was offered in various parts of this and other countries.

The area provides excellent undergraduate and graduate instruction for veterinarians, dentists, medical social workers, nurses and physicians. Those trained here, together with those who migrated to this area, conducted numerous important activities in the promotion of good health of the citizens and their domestic animals. They effected fine organizations, arranged for construction of hospitals and worked strenuously in private practice and public health. Excellent facilities were provided for all people, including the poor. Everything found of value in the betterment of human and animal health anywhere in the world was soon introduced into the Upper Midwest, and more that was new originated here.

The '80s and '90s constituted the era of epoch-making discoveries in parasitology and bacteriology. Another important era began in 1935 and has continued. It is characterized by the discovery of chemotherapeutic agents and antibiotics which have completely revolutionized the treatment of many bacterial diseases.

Nowhere in history has any other method of dealing with the sick and managing the public's health even remotely approached the system employed in the United States, of which this area is a part. From 1910 to 1914, more than one-fourth of the deaths in Minnesota occurred among children less than five years old and over one-third among persons under 20 years. Only one-fifth of the deaths occurred in persons of 70 years or older. Now children under five years bear only one-twelfth and persons less than 20 only one-ninth of all deaths. Two-fifths occur in persons of 70 years or older.

In 1948, the number of deaths from some of the common diseases was in sharp contrast to those of 1910, as follows:

	1910	1948
Pneumonia	1806	1009
Influenza	98	64
Diphtheria	566	15
Whooping Cough	172	14
Measles	263	11
Scarlet Fever	284	3
Typhoid	688	4 (28 cases)

Tuberculosis has been reduced from the first cause of death in 1910, when 2270 died, to the 10th in 1948, when 502 died. Through September, 1949, this disease was relegated to 11th place. In 1910 tuberculosis caused 9.9 per cent of all deaths, but only 1.8 per cent in 1948. Only 0.09 per cent of the cattle reacted to tuberculin in 1948. In many years there has been no case of human rabies or glanders, and no case of smallpox for the past two years.

During the past 80 years the Journal-Lancet has played an important part in these accomplishments. It has published thousands of articles written by physicians who thus presented results of their research, clinical observations, etc., to their fellow practitioners. It has announced new discoveries, inventions and methods in order that physicians might become more helpful to those whom they serve, individually and collectively. With equal fervor it has attacked imposters, charlatans, quacks and nostrums. It has supported every worthy project designed for the betterment of health.

The Journal-Lancet takes immense pride in the present health status of the area it has served. The average span of life is approaching three score and ten years. The diseases and conditions causing most of the morbidity and mortality now are those which have long accompanied old age. The future goal is not only to hold the gains already made and increase them, but also to develop methods of controlling degenerative diseases. Immortality is not anticipated, but much can probably be done to add to the comfort, happiness and efficiency of those who attain old age. In this accomplishment the Journal-Lancet plans to play an important role.

J. A. Myers, M.D.

THE IMPORTANCE OF MEDICAL HISTORY

The editors of the Journal-Lancet have chosen to feature some Minnesota Medical History. The field is inviting but for amateurs it offers some of the problems of learning to pilot a plane: You need a good take-off from an ample runway; but even more obviously a place to land intact. Once in the air, the uncertainty of coming down may lead to such extensive flight that fuel (historical incentive pattern behind worth while biography)—fails and there you are without the veteran's skill for a crash landing. Rebecca West and Margaret Mitchell display that skill as did Thackery and Dostoevsky; interminable detail but an astutely designed objective culminating in—"flight finished; objective attained."

Macauley wrote that all history is a series of biographies. Toynbee exploits noted figures somewhat as geographers designate landmarks or unusual terrain. The occult developments that precede "historical events" have been for the most part the province of Cassandra's Curse—the ability to truthfully forecast but never to be believed. I make a plea for more *readers* of medical history. Too many doctors live only in the present: The future must remain obscure, the past need not continue to reflect Tallyrand's pessimism—"History teaches only that it teaches nothing." Much biographical history of men in medicine in Minnesota is available. All too much is buried in the old files of medical journals. And the written word is no longer the only historical medium. There is available all the disciplines of photography and projection; and Edward Murrow and his associates have hit upon the assembly of phonographic recordings. When the great edifice becomes an accomplished fact and the memorial becomes a part of medical history will it be found that anyone had the foresight to place on record in some of their masterful addresses the voices of Wm. J. and Chas. H. Mayo.

E. L. Tuohy, M.D.

American College Health Association News

The 154 delegates to the twenty-eighth annual meeting of the American College Health Association reported an excellent program. The registrants represented thirty-five states and Canada.

After due consideration of the requests by members for a change of date of meeting, the council decided to hold the annual conferences during the first week of May. Therefore, the next meeting has been scheduled for May 3, 4, and 5, 1951, in the Chicago area. The 1952 meeting was tentatively set for Boston, the final decision will be made by the new council in May, 1951.

The following institutions were approved for membership in the Association:

National Colleges of Education—Josephine Earlywine, M.D.—Evanston, Illinois.

Xavier University—Warren Peter McKenna, B.S.—New Orleans, Louisiana.

University of New Mexico—J. E. J. Harris, M.D.—Albuquerque, New Mexico.

Colorado School of Mines—W. Lloyd Wright, M.D.—Golden, Colorado.

Catawba College—Mrs. Lula Ward Douglas—Salisbury, North Carolina.

University of Texas, Medical Branch—John W. Middleton, M.D.—Galveston, Texas.

Wagner Memorial Lutheran College—Miss Mary D. Burr—Staten Island, New York.

Occidental College—Mrs. Ruby R. Burgar, R.N.—Los Angeles 41, California.

The Creighton University — Thos. D. Fitzgerald, M.D.—Omaha 2, Nebraska.

Bowling Green State University—Hubert E. Schwarz, B.S.—Bowling Green, Ohio.

Champlain College of the Associated Colleges of Upper New York—William W. Johnson, M.R.—Plattsburg, New York.

University of Redlands—Mrs. Margaret S. Donaldson—Redlands, California.

Tennessee A. & I. State College—Carr A. Treherne, M.D.—Nashville, Tennessee.

University of California, Davis Campus—Charles L. McKinney, M.D.—Davis, California.

The newly elected officers are: President, Dr. Irvin W. Sander, Wayne University; President-elect, Dr. John E. Sawhill, New York University; Vice-president, Dr. Charles Goassage, University of Toronto; Secretary-treasurer, Edith M. Lindsay, University of California. New members of the council are: Dr. Grace Hiller, Goucher College, and Dr. Norman Moore, Cornell University.

We extend to Dr. and Mrs. John Sawhill, New York University, and Dr. Carl Wise, Columbia University, our appreciation for making all local arrangements.

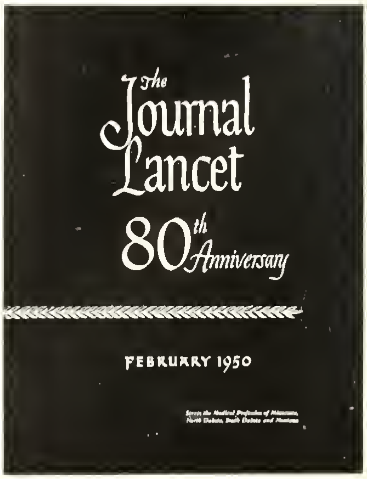
* * * *

The Twenty-Seventh Proceedings should now be in your possession. The delay in printing this report was not expected. It is our hope that future Proceedings will reach you within a reasonable time. The council voted to once again send two copies to each member institution beginning with the Twenty-Eighth Proceedings. If your library wishes a copy of the recent Proceedings, a request with three dollars should be sent to the secretary. A number of proceedings of past meetings are available at a reduced cost.

Dr. Charles E. Shepard is to be congratulated for his editorial work in the publication of the two Proceedings of this year.

A request has been received for nurses who wish to continue their education and work part time in a college health service in exchange for part of their fees. If interested, contact Mrs. Opal Thorpe, R.N., Supervisor of Health Service, Central Michigan College, Mount Pleasant, Michigan.

OUR NEW COVER DESIGN, announcing JOURNAL-LANCET's 80th anniversary, is the work of Frank Kofron, Minneapolis type designer, and student of the late typographer, Frederick Goudy. The lettering, done in the modern calligraphic style, carries with it some of the warmth and artistry of the old handlettered page. He has used the laurel branch, which stands for achievement, as the symbol of the tradition established by eight decades of continuous medical publishing. This cover, with adaptations for all our subsequent special issues, will be carried on throughout our anniversary year.



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EIGHTY YEARS OF PROGRESS IN SURGERY—

(Continued from page 80)

SUMMARY

My task in this discussion has been to sketch the bare contours of a few developments in surgery during the past 80 years and the manner of their achievement. It has been a pleasant assignment. If a surgeon who closed his career 80 years ago were to get a glimpse of the present day, it is difficult to say which would impress him most: our large and complex institutions or the accomplishments of the men who work in them. Whereas, our great hospitals and laboratories might provoke exophthalmos in some such observers, I think that surgeons of that era would be awed even more by what is done by surgeons in our hospitals today. If during an equal period of future years, surgeons continue to forge ahead as now guided by research, the life-line of progress, who among us is bold enough to say what surgeons will do then?

It is easy for surgeons of every age to feel that it will be difficult for their sucessors to surpass them. Let those who may even allow such a thought to cross their minds remember what Ambroise Paré said in 1575: "Posterity will not be able to surpass us (be it said without malice or offense) save by some additions, such as are easily made to things already discovered." How many times since anesthesia and asepsis have come to bless the ministrations of surgeons, have well-known surgeons in high places repeated Paré's prophecy! Such predictions are testimony not alone of the futility of prophecy; but what is more significant is that progress beyond the dreams of all prophets indicates the great catalytic effect of a single new fact upon all practices which arise from new found knowledge. Let us not blind ourselves to the great importance of a new fact; it remakes periodically our external environment. And if, in the internal environment of our personal lives we could learn to implement these gifts of science for our own happiness and welfare, as well as for our fellowman, what a glorious age would lie before us! Can that happen? Man is a perverse creature, and frequently refuses to accept what is best for him. It will probably always be so. Good men, however, are made patient, strong, submissive, sympathetic and wise by trial and tribulation. And when bitterness and vindictiveness, which are signs of weakness, make way in our leaders and in us to these better qualities, we may find, in the relationships of ourselves and our fellowman, new sources of happiness.

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Office suite for rent. Three rooms or more. Over drug store on corner of 50th and France South in Edina. Will decorate to suit renter. Lease if desired. Mr. A. L. Stanchfield, 4424 W. 44th St., Ma. 3371, Wa. 4806.

OFFICE FOR RENT

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

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Published monthly. Single Copies 35c. One Year $3

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The
JOURNAL
LANCET

Minneapolis, Minnesota
March, 1950

Vol. LXX, No. 3
New Series

Foreword

Problems of the diagnosis and treatment of diseases of the nervous system are often considered difficult ones by the physician who does not specialize in clinical neurology. Most parts of the nervous system are inaccessible to direct examination, and its intricate organization and integrated functions are difficult to comprehend on superficial observation. As a consequence, many practitioners are of the opinion that all neurologic matters belong to the realm of the specialist, and they make little attempt to diagnose or to treat them. This impression is far from correct, however, for many disorders of the nervous system come within the everyday experience of most practitioners. Furthermore, many systemic diseases may show evidences of nervous dysfunction as their first manifestations. Medical diagnosis cannot be made without some knowledge of neurologic diagnosis. There are certain rare conditions and diagnostic problems, it is true, that require long experience in the field of diseases of the nervous system for adequate appraisal, but the majority of the more common neurologic entities could and should be diagnosed and treated by the physician in general practice.

The JOURNAL-LANCET is devoting the pages of this issue to a series of articles dealing with clinical neurology. This is an opportune time for such a project. Neurology has come to its own, more than ever before, in the rehabilitation of those men who were injured during the recent World War. The newly organized American Academy of Neurology has served as an immense stimulus to the development of the specialty in this country. The International Congress of Neurology, held in Paris last September, has demonstrated the world-wide scope of neurology. Finally, the awarding of the 1949 Nobel Prize for Medicine jointly to Dr. Egas Moniz, Professor Emeritus of Neurology at the University of Lisbon, for his development of prefrontal lobotomy, and to Dr. Walter Rudolf Hess, Director of the Physiological Institute of the University of Zurich, for his work on the functional organization of diencephalon, has proven the recognition of neurology as an integral and essential part of medicine in general.

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Treatment of the Hemiplegic Patient

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In recent years considerable advance in the application of retraining techniques in the treatment of disabling neurologic disorders has been made. It would seem important, therefore, to review these advances as they relate to the care of hemiplegic patients. For years, some chronic neurologic disabilities have been subjected to rehabilitation measures. This is particularly true of poliomyelitis and a large number of spastics among children. Results of rehabilitation in these latter groups speaks for itself. During the past few years, increasing attention has been paid to the retraining of patients with hemiplegia.

In July, 1946, a program of retraining therapy was organized at the Veterans Administration Hospital, Minneapolis, as a project of the neurology section, with the cooperation of the physical medicine rehabilitation service.[1] During the two and one-half years ending January 1, 1949, 289 patients with various disabling neurologic disorders were treated with encouraging results. Hemiplegia comprised almost one-half (105) of the total number of cases. The program and results described in this report are based upon experience with these hemiplegic patients.

Treatment Program

On the basis of present knowledge, the program of treatment of disabling neurologic disorders consists of three phases.[2] First is total evaluation of the patient, which includes a general medical, a complete neurologic, and a limited psychiatric examination, as well as determination of the patient's social and vocational situation. The evaluation should determine the cause, location, and severity of the neurologic lesion and an estimation of expected progress. In addition, the patient's blood pressure, cardiac reserve, urinary status and orthopedic disabilities must be noted since all play a very important part in the ultimate result. It is particularly necessary to evaluate the physical assets of the patient, both present and future, with special reference to what residual function he has or may develop. These residual functions play a large part in determining an ultimate goal. The patient's primary personality, his basic intelligence, the degree of organic deterioration, and the interests and motivating forces of the individual should be considered. Frequently, interrelationships between the patient and his family determine the ease with which the final result is obtained. Consequently, an estimate is made of the patient's home situation, his attitude toward his family, and his family's attitudes toward him. A review of the patient's vocational aptitudes, abilities and interests is most helpful in setting a vocational or avocational goal for these patients.

The second phase of the program is setting a treatment goal based upon results of the total evaluation. From this point on, all therapeutic procedures are directed toward achieving this goal. It is apparent that the ultimate goal varies greatly from one patient to another. For example, in some of the more involved hemiplegias, especially among older patients with limited cardiac reserve, the maximum goal may be one of self care activities, limited ambulation, and a hobby. In others, particularly in the younger age group, a goal of greater or lesser economic independence can often be achieved. It is only in individuals who are severely deteriorated, who have a marked personality disorder, or who have a widespread and rapidly progressing neurologic disorder, that some goal of treatment cannot be set.

The final phase of this program is concerned with methods of achieving the goals. It is important to emphasize that the success of a treatment program is not the result of efforts of the single individual or single skill but requires the coordination of all therapeutic influences brought to bear upon the patient. Accomplishment of a coordinated program necessitates supervision and guidance by the physician in charge of the patient. He must be acquainted with all aspects of the patient's condition and treatment program and he must keep in mind the physical limits of the patient and the social and economic possibilities involved in each case. He can then proceed with the treatment program.

From a physical standpoint, treatment begins with physical therapy during the acute and subacute stages of the illness aimed at preventing contractures and instituting early passive and active movements. This is followed by corrective therapy which emphasizes reconditioning of the patient and re-education in the use of uninvolved parts for substitution problems, education in daily self care and ambulation activities.[3] Occupational therapy should be both diversional and functional. Prevocational therapy is added later and is aimed at preparing the patient for the type of job which he would be capable of handling in view of his residual disability. Adapted sports and recreation are used to provide motivation and maintain interest. Special speech therapy is indicated in the aphasic and dysarthric disorders. The nursing staff must be well informed as to the nature of the program to ensure cooperation by preventing dependency on the ward and seeing that the patient's performance is kept abreast of his abilities. Social service therapy is instituted on admission to the hospital and continues throughout the entire program.

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ETIOLOGY

The syndrome of hemiplegia is produced by varying causes. In young individuals, one most frequently encounters infections and tumors. Among older individuals, the most common cause is a hemorrhage or a thrombosis. In addition, there are numerous other less common causes. Because of the multiplicity of causes and their direct effects upon the entire program of rehabilitation, careful consideration should be given to the specific etiology in each case. Following recovery from a stroke, the average patient will have a severe weakness of the arm, leg, or both. Early this paresis is frequently flaccid, but later it becomes spastic. Because of immobility and spasticity, contractures are a common development, particularly in the shoulder, wrist, hip, and knee. A spastic, inverted foot is an additional common complication.

The outlook for functional recovery is variable from patient to patient and can be determined only by careful neurologic evaluation from time to time. Long continued flaccidity, the loss of reflexes, and the early onset of contractures are unfavorable signs. The early return of reflexes and function implies rapid and complete recovery. *All patients with hemiplegia, regardless of the degree of recovery, are capable of ambulation if given adequate rehabilitation therapy.*[4] Because these patients are frequently in the older age group, they are subject to high blood pressure, heart disease, kidney disease, or diabetes. However, it is seldom necessary to deny the patient the benefits of rehabilitation because of these conditions.

Initial care of the hemiplegic patient consists chiefly of good nursing care and general medical treatment. During this period, he is placed on a schedule for eating, bowel habits, waking and sleeping. Therefore, the early first contacts of the nurse with the patient, encouraging him to help himself, are the beginnings of rehabilitation.

Social service is notified immediately after admission and a social worker interviews the patient's family. At this time, the general aims of the program are outlined to the family, and an estimate is made as to the length of time before the patient will be ready to return home. Any financial or social problems resulting from the patient's illness are discussed, and the family is encouraged to use social service facilities to the fullest extent. The social worker also develops contact with the patient as soon as the patient's condition permits, and continuous contact with both the patient and family is maintained throughout the entire hospital stay.

Since most hemiplegics are kept in bed for a period of three to six weeks depending upon the severity and cause of their involvement, it is necessary to begin physical therapy on the affected limbs within the first week while the patient is still bedfast. During the stage of flaccidity, daily passive motion through full joint range is instituted. Bed posture is corrected and supportive measures are instituted to maintain good body alignment, relieve tension on weakened or paralyzed muscle groups, and to prevent deformities from developing. Hot packs or radiant heat are used to relieve muscle spasm and pain, when present, preparatory to exercise. If contracture or muscle shortening has occurred, motion must be carried to the point of slight pain. The shoulder, hand, hip and knee joint are particularly important due to the rapidity with which contractures may occur and the marked effect which such contractures will have on function. Weight bearing on a slightly flexed knee requires relatively great quadriceps strength. This is in marked contrast to the knee locked in full extension which can bear weight with little or no quadriceps innervation.

With the first sign of returning function, the patient is encouraged to assist actively in all movements initiated and completed by the physical therapist. A powder board and counter-balanced sling suspension apparatus are used to eliminate gravitational pull in the patient's first attempt to move actively. Active assistive exercise is active effort on part of the patient to move his limb, assisted by the physical therapist who helps initiate or complete the movement. Assistive movement requires keen judgment on the therapist's part to aid only when the muscle is too weak to accomplish its movement. The alert therapist can eliminate inertia, gravity, and friction, and thus allow a feeble and weakened muscle to carry the part through as complete an arc of motion as possible. Exercise should be carried out daily and the muscle should be worked to a point short of fatigue. This program of assistance in movement is carried out until the muscle is capable of normal motion and of such strength as to carry the limb through a range of motion for several repetitions. Pulley therapy enables the patient to give himself passive or active assistive exercises.

Active exercise, in which the patient makes the entire motion himself without assistance, is next employed to hasten restoration of muscle function. Active exercise should be undertaken once daily and the muscle should be worked to a point short of fatigue. The value of effort put forth by the patient will largely determine the success of the exercises. Consequently, attention to daily effort within the full capabilities of the patient is necessary.

Between therapy periods, footboards and sandbags may be used to hold the foot at a right angle and to prevent external rotation of the thigh. In selected cases, posterior splints may be substituted. Light cock-up splints may be indicated for the hand and wrist.

When the patient is able to be up in a wheelchair, he is taken to a corrective therapy gymnasium for more vigorous activities in a group setting. At this time, the patient becomes a more active participant in his own retraining. The main efforts are directed toward self care and ambulation activities which are part of the daily requirements of living.

It is possible to teach self-care by three methods: (1) by direct use of the patient's personal effects and facilities; (2) by the use of simulated objects; (3) by the use of related activities in the exercise gymnasium. The direct method is probably the best since it has the advantage of teaching the activity in direct relationship to its practical application. For example, the patient is taught to shave with his own razor, to dress with his own clothes, to get into and out of his own bed, and to use regular toilet facilities. Feeding is actually taught in the dining hall.

Before undertaking actual ambulation, it is often ncessary to improve joint range and muscle power by pulley therapy and progressive resistance exercises. The patient practices balancing and shifting his weight from foot to foot. Walking in the parallel bar is practiced with especial attention to posture, balance, and foot placement. The normal progression of ambulation is next to crutch gaits, then to cane gait. When possible, all aids are discarded. Special attention is given to stair climbing. Final stages include development of distance and speed, negotiating curbings and streetcar steps, and completely discarding the wheelchair.

Figure 1

Self Care

1. Change position in bed	Below 16% 0
2. Feed self	
3. Wash hands and face	
4. Brush teeth and comb hair	16%-32% +1
5. Write name and address	
6. Use telephone	
7. Sit up for six hours	
8. Get from lying to sitting position	
9. From sit on bed to stand	33%-60% +2
10. Tie pajama bottoms	
11. Put on and take off shoes	
12. From bed to wheelchair to bed	
13. Sit and arise from armless chair	
14. Put on and take off pajama bottom	
15. Put on and take off pajama tops	
16. In and out of chair at table	61%-84% +3
17. Shave self	
18. Pick object off floor	
19. Use toilet without assistance	
20. In and out of car	
21. Tie shoes	
22. Put on and take off braces	85%-100% +4
23. Clothe self completely	
24. Take bath without assistance	
25. Get from floor to stand	

When the patient is not engaged in physical or corrective therapy, he is encouraged to participate in occupational therapy. Woodworking, braiding, finger painting, and clay modeling offer excellent exercises for the development of the hemiplegic hand and wrist, while the bicycle, jig-saw, sewing machine, and similar treadle apparatus are used for the development of the foot and ankle.

Speech therapy is introduced if an aphasia is present. The patient is encouraged to use his language residual as much as possible, and materials are provided by the therapist for retraining and expansion of the limited function. The course of speech therapy is often much more prolonged than any of the other rehabilitation procedures and frequently must be continued after the patient has left the hospital.

Among younger individuals, prevocational training is begun in the hospital, and contacts are made for him to continue his training after discharge from the hospital.

Criteria of Performance

Criteria of performance, based on a large number of activities required for daily living, are the objective measures of a patient's improvement.[3] These activities may be divided into two main categories: self care activities and ambulation activities (Fig. 1 and 2). We have selected twenty-five activities for each category, representing those activities considered most important to our patients. Four points are allotted to each activity performed, making a possible score of 100 both in self care and in ambulation activities. Each patient is tested on admission to the neurologic rehabilitation service, his progress is recorded during his stay, and a final rating is made on discharge. A review of the activities listed indicates that a patient achieving a score of 0 to 15 (noted 0 on a scale of 0 to 4+) is almost helpless, whereas a patient scoring 16 to 32 (1+) is still very dependent. For this reason, a score below 33 is considered as failure. A score of 33 to 60 (2+) indicates moderate independence on the part of the patient, while a score of 61 to 84 (3+) indicates that the patient requires help with only a few of the necessary daily activities. If the patient scores 85 to 100 (4+), he requires little or no help and in many cases is capable of employment.

Figure 2

Ambulation

1. Arise and stand with aid in parallel bars					Below 16% 0
2. Arise and stand without aid in parallel bars					
3. Shift weight from foot to foot in parallel bars					
4. Walk in parallel bars with assistance					16%-32% +1
5. Walk in parallel bars without assistance					
6. Walk with assistance of instructor					
7. Walk without assistance, instructor by side					
8. Arise to stand from wheelchair without aid					
9. Walk alone, using crutch					33%-60% +2
10. Climb stairs with railing					
11. Climb stairs with rail backwards					
12. Walk sidewards and backwards					
13. Walk alone using cane					
14. Walk on ground and carpeting (rugs)					
15. Open and close door from stand					
16. Climb bus steps					61%-84% +3
17. Climb curb					
18. Climb steps without hand rail					
19. Discard wheelchair					
20. Distances (feet)	25	50	75	100	
21. 48 feet—seconds	85	80	75	70	
22. Distances (feet)	150	200	300	400	85%-100% +4
23. 48 feet—seconds	65	60	50	45	
24. Distances (feet)	500	600	700	800	
25. 48 feet—seconds	40	35	30	25	

In addition to objective measurement of the patient's abilities, it is important also to note the patient's adjustment to his social situation. The teaching of self care and ambulation is useless unless the patient actually uses his new skills in his daily living. For this reason, patients are observed with respect to the personal characteristics (Fig. 3). A subjective estimate is made of the patient's social adjustment and the progress he makes toward achievement of the maximum goal of which he is capable. This rating is made on the following basis: failed (0), poor (1+), fair (2+), good (3+), superior (4+). Thus, it is possible for a patient to rate 4+ on self care and ambulation while the social adjustment rates 0 or 1+. Conversely, a severe disability in an older patient may rate superior (4+) on social adjustment and at the same time have an ambulation and self care rating of 2+.

Figure 3

Social Readjustment

Rating of social readjustment was graded subjectively from 0 to plus four. Criteria used included an estimate of the progress made toward the achievement of the goal expected in view of patient's total abilities and disabilities. The following individual characteristics were considered:

1. Cooperation
2. Initiative
3. Personal hygiene
4. Stability
5. Adaptiveness
6. Consideration of others
7. Competitiveness
8. Determination
9. Enthusiasm
10. Maturity
11. Planning for future
12. Sociability

Results

During a two and one-half year period, a total of 253 patients were discharged from the neurologic rehabilitation service of the Veterans Administration Hospital, Minneapolis, of whom 105 were hemiplegic patients. Four of the patients remained insufficient time for an evaluation of the results; five died of varying causes during the course of therapy; and eight were not severely disabled at the time of admission. The remaining 88 severely disabled patients were studied intensively with the following results: 60 (68.2%) achieved 85-100% of activities, 13 (14.8%) achieved 61-84% of activities, 9 (10.2%) achieved 33-60% of activities, 6 (6.8%) failed to achieve 33% of activities. Four of the failures were due to severe organic brain damage, one was due to the development of gangrene of both legs requiring bilateral amputations, and one failed due to a fractured hip incurred during the time of treatment.

The average age of the patients was 54.4 years (the oldest patient so far treated is 82 years), and the average duration of disability before treatment was 10.6 months. The average retraining period was 3.8 months.

Conclusions

1. The retraining program for disabled neurologic patients at the Veterans Administration Hospital, Minneapolis, is described. The specific application of such a program to hemiplegic patients utilizes a team approach under the direction of the neurologist. Such a program of therapy can be adapted for treatment of patients in the home or as outpatients.

A review of 105 hemiplegics indicates that at least 85% of such patients show improvement under such a program.

3. Age, duration of disability, and complicating medical conditions will influence the course of treatment but do not contraindicate instituting retraining therapy.

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SURVEY OF HANDICAPPED

A survey among physically handicapped adults who are in need of specially designed homes which will help to restore them to useful activities is being conducted by the National Society for Crippled Children and Adults.

According to Dr. Howard A. Rusk, chairman, Department of Rehabilitation and Physical Medicine, New York University, many of the five million handicapped persons in the U. S. could be restored to normal, useful lives if they lived in properly designed homes that would include such functional units as ramps instead of steps, wide passages for wheel chairs, colors schemes for ease in cleaning, facilities built for chair height, safety features, etc.

From this survey, the society will prepare a digest of suggestions and ideas for designers, engineers, and architects who will work on this model home project. The National Society for Crippled Children and Adults, 11 South LaSalle Street, Chicago 3, Illinois, is interested in receiving the names and addresses of handicapped adults who will be asked to take part in this survey.

Spinal Subarachnoid Alcohol Injection

As a Final Palliative Procedure in Cases of Spastic Paraplegia in Flexion

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Treatment in cases of spinal paralysis depends on the nature of the cause of paralysis, the age of the patient and his general physical condition. If the cause is not progressive, the goal is eventual rehabilitation. If the underlying disease is progressive and one for which there is no cure, the aim is to make the patient as comfortable as possible, to relieve pain and to provide some mechanical means for disposing of excretory wastes.

The natural course of events in cases of anatomic severance of the spine is well known. The first stage, called "spinal shock," consists of sensory loss below the segmental level of the lesion, flaccid paralysis, loss of reflexes, anhydrosis, fall in blood pressure and sphincter tonicity. This is a vulnerable period for skin and bladder. Dry skin ulcerates as a result of even mild pressure. Rapid decalcification of the bones occurs. Large quantities of calcium are excreted in the urine and stones may form in the urinary tract.[1] After about three weeks, provided the patient has been free of sepsis, spinal automatism begins to function and the period of spinal shock passes. Spinal reflex activity first manifests itself as the Babinski response on stimulation of the lateral foot margin.[2] Tone returns first to the flexor muscles of the lower extremities, the hamstring tendon reflexes appearing before the patellar and ankle reflexes. Spontaneous flexor movements develop and sweating returns in about two months.

In four to six months the mass reflex occurs in response to any noxious stimulus applied below the level of the lesion. This consists of violent flexor spasms of the legs, profuse perspiration below the level of the lesion, evacuation of the bladder and bowel and occasionally even priapism and ejaculation. During this stage the trophic condition of the skin and muscles is very good and bed sores are controlled more easily. It is not possible to comment on the neurotropic mechanisms involved in the cause and healing of bed sores. However, the state of spasticity in flexion becomes an important mechanical interference in the nursing of the patient and the treatment of decubiti. Not all patients are seen from the inception of injury or accident. Frequently, bed sores are far advanced and spastic contraction in flexion makes it impossible either to immobilize the wounds or to support the weight of the patient off them. Even when bed sores finally heal the patient with spastic contractures cannot be put in braces effectively and, therefore, cannot be rehabilitated.

Orthopedic operations have been devised in endeavors to straighten spastic limbs. The case of a twenty year old boy whose spinal cord had been severed by a bullet is cited. His legs became spastic and went into flexion. He was subjected first to one and then another muscle sectioning procedure, only to have his limbs assume fixated positions at inappropriate angles. Finally, when the bellies of every muscle exposed in the upper thighs and hips were sectioned the femurs had already become fused at functionless angles to the pelvis. All that remained to permit the patient to move about in bed or wheel chair was amputation of both legs.

Root sectioning procedures have been devised to render the limbs flaccid.[3,4,5] These require extensive laminectomy and section of anterior or posterior roots from T-11 through S-1. Munro has published a description of the technique for anterior rhizotomy from the eleventh thoracic through the first sacral roots for relief of spastic paraplegia in flexion. Preservation of roots S-3-4 permits spinal autonomic operation of the bladder.

Many cases of spastic paraplegia in flexion are not justifiable candidates for extensive operation. Among contraindications to major surgical procedures are the following conditions: extreme debilitation; presence of infected tissue in or about the operative site; and progressive nature of the underlying disease giving the patient too short a life expectancy to enjoy whatever benefit might accrue from operation.

A procedure that would interrupt reflex pathways from the sensory to the motor end organs of the lower extremities was sought. The procedure had to be simple and unaccompanied by shock. It was thought that if absolute alcohol were floated into the subarachnoid space with the caudal extremity elevated, as Dogliotti had done for relief of intractable pain, the lumbo-sacral roots might be devitalized and the state of spasticity in flexion changed to that of flaccidity.

Technique of Injection

Absolute alcohol is lighter than water and tends to float on top of the spinal fluid before dissolving with it. Therefore, it is absolutely imperative that the patient's caudal extremity be the highest portion of his spinal column.

Procedure: The foot of the bed is raised appropriately to elevate the caudal extremity of the spinal column. The patient lies on his side in position for lumbar puncture. The upper side will be treated first. As many cubic centimeters of spinal fluid are withdrawn as the estimated number of cubic centimeters of alcohol to be injected. Five to ten cubic centimeters have sufficed in most cases. The alcohol is injected slowly but steadily, about five to ten seconds being taken to inject five cc. Anesthesia and flaccidity in the top lower limb follows immediately. The patient is allowed to remain in the same position with caudal extremity elevated higher than head and shoulders for one hour. The procedure is repeated on the opposite side the following day to render the other lower limb flaccid and anesthetic.

The danger in the procedure rests in the possibility of positioning the patient improperly. It is important for the operator to bear in mind that the alcohol is lighter than spinal fluid and therefore floats on it before entering into solution.

Report of Cases

Case 1. A man aged 33, fell from a tree, losing consciousness immediately, and on recovery could not move his legs. Examination showed that he was paralyzed and anesthetic below the ninth thoracic segment, and x-ray demonstrated a compression fracture of the seventh thoracic vertebra. Decubiti formed over the sacrum and both hips. With an indwelling catheter and tidal drainage with acriflavin he developed edema of the penis and scrotum, and a supra-pubic cystotomy was performed.

When seen again by the neurologic service four months later, the patient was in the characteristic position of spastic paraplegia in flexion. He was emaciated to an extreme degree. His temperature had been fluctuating daily from 95° to 106° Fahrenheit. The pressure sore over the sacrum had healed partially with a thin covering of granulation tissue and new epithelium. This area was still chronically infected, however, and presented a risk in operative approach to the lower spinal segments. The denuded area over the right hip was raw, the muscles were in constant motion and oozed blood continuously. The shaft of the femur in this area was exposed. The ulcer over the left hip extended to the acetabulum. The head of the left femur had disarticulated and was exposed black and necrotic. The legs were flexed with the knees up to the patient's chin. Patellar reflexes could be obtained with difficulty. The Achilles and hamstring tendon reflexes were more active. Clonus could be elicited in each ankle and the Babinski response was present on both sides. The slightest touch on the skin of the legs produced a strong mass withdrawal response.

Spinal puncture was performed a short time after this. With the foot of the bed supported on shock blocks, the patient turned on his right side, the puncture was performed between the third and fourth lumbar spines and eight cubic centimeters of spinal fluid were withdrawn. Six cubic centimeters of absolute alcohol were introduced within thirty seconds. The patient's legs became limp immediately. On the following morning the left leg was still limp but the right leg exhibited the flexor spasm. The procedure was repeated with the patient turned on his left side, and this time twelve cubic centimeters of spinal fluid were withdrawn and ten cubic centimeters of absolute alcohol were introduced within thirty seconds. The right leg became limp immediately. Both legs remained flaccid subsequently.

Case 2. A woman aged 42, in the terminal stages of multiple sclerosis, had been bedridden for two years and was completely paralyzed below the waist. Her skin was subject to an allergic dermatitis that frequently caused painful lesions of her arms and legs. She complained incessantly of perineal discomfort and aching pains in her knees, thighs and legs. Her lower extremities were spastic in flexion, and for two months she had been subject to strong flexor spasms associated with contractions of her abdominal muscles. During these, her bladder overflowed about the catheter and as often as two or three times a day she expelled the mushroom catheter. Her thighs maintained strong adductor spasms so that the knees continually pressed against each other, eroding the inner surfaces and adding to her pain. The position of her legs made it impossible to turn on her abdomen and precluded adequate bathing of her genitalia and perineum.

Lumbar puncture was performed as described, with the patient on her left side. Six cubic centimeters of absolute alcohol were introduced and the right leg became flaccid. The procedure was repeated the following day and the other leg became flaccid. Both legs remained limp subsequently. A level of loss of sensation developed in the right side below the eleventh dorsal segment and on the left side below the eighth dorsal segment. Cystometry performed before and after each puncture resulted in the same type of cystometrograms. The bladder acted like a balloon before and after interruption of sacro-spinal innervation. It was felt that there was probably sufficient fibrotic change in the patient's bladder to preclude any neurophysiologic deductions from the findings in her case. However, prior to spinal alcohol injection the bladder expelled large mushroom and Foley catheters during mass reflex spasms. After spinal alcohol injection, the retention catheters remained in place without difficulty.

Discussion

At the time this procedure was devised, it was believed that spinal alcohol destroyed too much to be of value in cases with good prognosis for life where partial motor function remained in the lower extremities and where autonomous bladder regulation might be established. Anterior rhizotomy was felt to be the only procedure that would maintain a worthwhile bladder in cases of complete cord transection.

Subsequently, Shelden and Bors [7] have used the spinal subarachnoid alcohol procedure in treating twenty-four patients with paraplegia of both legs of at least one year's duration with no evidence of improvement of motor function. They report improved bladder usefulness in all patients regardless of whether the bladder had been atonic or hypertonic prior to the procedure. However, they recommend that subarachnoid alcohol injection be reserved for those patients with incapacitating mass reflexes who have atonic bladders with excessive residual urine or hypertonic bladders with small capacity and frequent voiding. They do not state whether they used the procedure in cases that retained any posterior column function. Certainly in treatment where rehabilitation is the therapeutic goal proprioception should be spared wherever possible. In treating patients with good life expectancy Shelden and Bors have taken this procedure into a field where the author feared to tread. It is possible that with good judgment it may have further usefulness than that indicated in this report. Neurosurgical anterior rhizotomy is a formidable procedure. It is available only in areas where expert neuro-surgeons are obtainable. Subarachnoid alcohol injection is an extremely simple procedure. Its very simplicity is perhaps its greatest danger. The possibilities for doing damage with indiscriminate use are all too obvious.

We are all familiar with the selective action of certain toxins and infectious processes that have selective action on the sensory nerves and sensory roots. An agent which would permanently paralyze sensory nerves and have no action or only transitory action on the motor nerves, which could be administered in a vehicle of significantly different specific gravity from that of spinal fluid and whose toxic action would rapidly dissipate on dilution with spinal fluid would be an extremely valuable adjunct in rehabilitation of spastic spinal paraplegics in whom alcohol is too drastic an agent to use. Such a drug should be sought by pharmaceutical companies who have facilities for chemical and animal research.

Conclusion and Summary

Introduction of absolute alcohol into the lumbo-sacral subarachnoid space is presented as a final palliative procedure in the treatment of cases of spastic paraplegia in flexion. In patients with good life expectancy who are able to stand the operation, anterior rhizotomy, as described by Munro, is a preferable procedure because:

1. It destroys less neural tissue.
2. It preserves a more complete autonomous neuro-regulatory mechanism for the bladder.
3. It maintains the anti-dromic vascular regulatory mechanisms for the skin.
4. It can preserve whatever sensory mechanisms that may be still intact.

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Tularemic Encephalitis and the Neurologic Manifestations of Tularemia

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Topeka, Kansas

Since the early descriptions of tularemia, the disease has been classified into four types,[1] the ulcero-glandular, the oculo-glandular, the glandular, and typhoidal. Occasionally there are added pneumonic and oral-abdominal forms.[2] This arbitrary division, by emphasizing the focal lesions, obscures the basically septicemic nature of the disease. The initial pathologic change does occur at the site of inoculation of the organism, but a bacteremia ensues soon thereafter, and the organisms then appear to have a predilection for lodging in the lungs, liver, spleen, and lymph nodes. Occasionally they may invade the central nervous system and there produce a meningitis and/or an encephalitis. It has been intimated that the central nervous system involvement by tularemia is merely a terminal complication,[1,2,3] but it is obvious from previously reported cases, and from the case presented here, that the lesions in the central nervous system are a direct result of tularemic bacteremia.

During the septicemic invasion by B. tularensis, neurological symptoms and signs appear occasionally. These may be divided into three categories. The most common are non-specific neurologic phenomena which are attributable to the severe septic or toxic state. Secondly, there may develop a lymphocytic meningitis. Thus far only eleven cases of confirmed tularemic meningitis have been reported.[4] Finally, there are indications that an encephalitis may develop. Only one case of tularemic encephalitis has been reported,[5] but there are suggestions in other reports that the disease is more common than this single report would indicate. Our purpose then is to report another case of tularemic encephalitis. In doing so, we shall attempt to clarify the nature of the intracerebral complications of tularemia.

Case Report

C. W., a 27-year-old white male, was admitted to Winter Veterans Administration Hospital because of an abscess of the right fifth finger, regional adenitis, and chills and fever of six days duration. He had felt well until a hunting trip, during which he became somewhat fatigued but had no specific symptoms. Two days later he developed some nausea, generalized aching, and began to feel alternately hot and chilly. The next morning he noted further that his finger throbbed and pained severely. He was hospitalized locally and given quinine, penicillin, and sulfaguanidine. Despite medication a tender adenopathy developed in the right axilla, and fever and rigors continued night and day. On the fifth day of illness the lesion of the finger became localized into an abscess; this was incised and a 5 millimeter foreign body was removed. His temperature rose to 104 degrees. Because of the obvious septicemia and because the patient was becoming delirious and unmanageable, he was transferred to Winter Veterans Administration Hospital. The general physical examination on admission was normal except for findings in the right upper extremity and in the nervous system. Cellulitis of the proximal portion of the right fifth finger with a central crusted draining lesion was observed. There were numerous tender supratrochlear and axillary nodes and

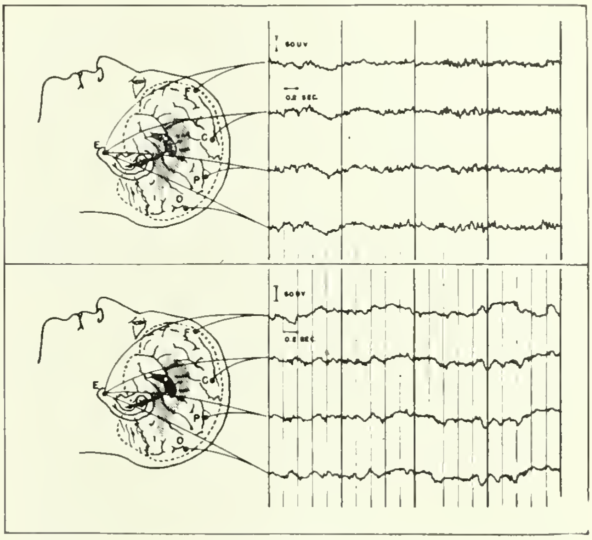

Fig. 1. Low voltage fast activity with occasional burst of four per second waves, one week after the onset of tularemia.

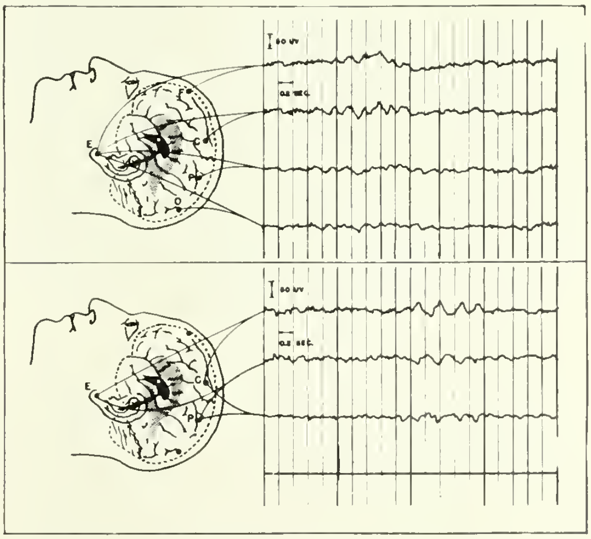

Fig. 2. Bursts of four per second, 50 micro-volt waves and out of phase activity in triangulation about the left ear, eleven days after the onset of tularemia.

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tenderness along the medial aspect of the right forearm and arm. Initial neurologic examination revealed mild clouding of the sensorium, delay in responses to questioning, and general lethargy. There was obliteration of the physiologic cupping of the optic discs bilaterally, blurring of the disc margins on the right, and transient nystagmus on looking to the left. The left biceps and radial reflexes were hyperactive, and Babinski and Rossolimo signs were elicited on the right. Two days later the patient manifested a definite right facial flattening, right convergent strabismus, and hyperactivity of the masseter reflex. The left patellar, suprapatellar, and ankle reflexes were more active than the right, and there was left ankle clonus. There also developed marked resistance to flexion of the neck.

One week after the onset of this acute illness an electroencephalogram showed low voltage fast activity with a small amount of mixed frequency alpha in short runs, having an amplitude of 20 to 30 microvolts. There were also brief runs of 5 cycle per second waves of 30 microvolts on the left side of the head (Fig. 1). This was indicative of mild cortical damage. By the eleventh day the electroencephalogram had become a predominantly low voltage fast record with brief runs of 5 to 7 per second delta activity up to 30 microvolts in amplitude and symmetrical in all leads. In the left temporal area there was evidence of delta activity at 50 microvolts with a few 4 cycle per second waves (Fig. 2). This was interpreted as indicative of diffuse cortical damage with a suggestion of localization in the left temporal area. A lumbar puncture performed on the ninth day of his illness was completely normal.

Because of the patient's failure to respond to intensive penicillin therapy, he was started on streptomycin on the ninth day of illness, and this treatment was maintained for six days. On the tenth day agglutination for B. tularensis was reported as 1:640. It was only then that he revealed that he had been skinning rabbits two days prior to his present illness. The patient became afebrile and subjectively asymptomatic within 48 hours after the institution of streptomycin therapy. Prior to his discharge 25 days after onset of illness, the patient had regained about ten pounds of weight and felt much improved. Since streptomycin had already been instituted at the time the agglutination was reported, subsequent blood cultures were negative.

By the 22nd day the electroencephalogram had reverted to normal and the slow activity previously reported was now absent. A liver biopsy performed after the patient's discharge showed necrotic liver cells with areas of concentric arrangement of inflammatory cells in the liver. These were mostly polymorphonuclear leukocytes and some lymphocytes. There were also some endothelial cells and a few proliferating fibroblasts. These liver changes were considered to be multiple focal areas of inflammation and necrosis of liver cells, compatible with the diagnosis of tularemia. At the same time, the agglutination to tularemia had risen to 1:2560. Two months after the acute onset the patient still had some hyperactivity of the left patellar, suprapatellar, and ankle reflexes. Otherwise he had reverted back to his premorbid state except that it was the impression of the people working with him that he was more irritable and more difficult to get along with than previously.

Discussion

The patient developed ulcero-glandular tularemia. Within five days after the onset of the local symptoms he began to manifest a mild confused state, cervical rigidity, focal neurologic signs such as blurring of the optic disc margins, nystagmus, facial flattening, hyperactivity of the deep reflexes, pathologic reflexes and ankle clonus on the left, and an abnormal electroencephalogram. Some of the reflex changes persisted for several months after the acute infection had been cured.

The nature of the neurologic complications may be understood best if it is realized that bacteremia occurs shortly after inoculation of the organism.[3] This produces necrotic lesions in the spleen, liver, lungs, and lymph nodes. The focal lesions of these organs may then enlarge, liquefy, and produce multiple abscesses. From these foci, a second bacteremia may ensue which will spread the infection over a wider area. Neurologic symptoms then may be observed either relatively early or late in the course of the disease.

In a series of 85 fatal cases, 33 are reported as involving the nervous system.[6] This creates the impression that neurologic involvement is a common complication of tularemia. However, when cases of meningitis are excluded from the series, the nature of the central nervous system changes is less clear. It appears that most of the neurologic changes that occur are seen as an expression of the severe septic and toxic state that prevails. These symptoms, which occur even at the onset of the illness or any time thereafter, may consist of headaches, convulsions,[7] confusions, delirium, auditory hallucinations, drowsiness,[8,9] stupor,[4c,10] urinary and fecal incontinence,[11] tremors of the tongue and extremities,[8,10] dysarthria,[6,8,11] cervical pain and rigidity,[8,12,13] and photophobia.[12] None of the cases in this category showed any abnormality of the spinal fluid, and postmortem findings[8] did not reveal histopathologic changes characteristic of tularemia. Instead, in one instance in which the patient manifested sudden deafness during tularemia, only fatty degenerative but non-inflammatory changes were evident in the neurones, glia, and muscularis of the vessels. There was degeneration of the myelin in the eighth nerve.[14]

The most common specific neurologic involvement of tularemia is meningitis. This occurs in from three to eleven days after onset of symptoms and has been observed in association with all types of tularemia. The patients affected have ranged in age from 5 to 52 years.[4] Symptoms of tularemic meningitis have included delirium, stupor, cervical rigidity, tremors, tache cérébrale, seizures, palatal paralysis,[4a] nystagmus,[4f] altered and pathologic reflexes, and paresis of the lower extremities.[4k] The spinal fluid in these instances has been under increased pressure and contained from 200 to 2100 leukocytes, of which 70 to 100 per cent were lymphocytes. The organism has been recovered from the spinal fluid by bacteriologic methods. Only two of the cases of tularemic meningitis have survived.[4g] In the other cases death occurred in from ten to eighteen days after the onset of the meningitis. The brains and spinal cords showed a diffuse thickening and lymphocytic infiltration of the meninges. There were nodular meningeal thickenings containing round cells, polymorphonuclear leukecytes, and occasional Langhans, and some epithelioid cells. These lesions also involved the ependyma.[4b,i] At times, the meningeal[4b] and ependymal lesions[4i] extended into the upper layers of the cortex or the periventricular areas respectively, and there they produced large necrotic foci.

Thus far only one definite case of intracerebral tularemia without meningitis has been reported previously.[5] That patient developed headache, somnolence, stupor, nystagmus, and hypoactive reflexes on the right in association with ulcero-glandular tularemia. A lumbar puncture revealed a bloody fluid containing 145 leukocytes.

The corpus collosum, basal ganglia, and pons contained numerous minute necrotic and hemorrhagic foci, infiltrated with leukocytes and similar to the lesions of the lymph nodes and lungs. The adjoining vessels showed proliferative endangiitis. It may be that other cases which have shown delirium, cervical rigidity, positive Babinski signs,[8] deafness,[14] and seizures, if adequately studied neuropathologically, would have also shown evidence of tularemic encephalitis.

Hence it appears that neurologic signs and symptoms have been found in all stages and types of tularemia. Some of these developed without any evidence of abnormality of the spinal fluid and with no evident pathologic changes in the brain. These may be results either of the toxic or septic state, or instances of tularemic encephalitis in which adequate clinical and neuropathologic investigations had not been performed. The most definite changes are evident when a tularemic meningitis develops which reproduces in the meninges the changes found in other organs. However, there are indications that tularemic encephalitis may develop independently of the occurrence of a meningitis.

Summary and Conclusions

The initial lesion of tularemia develops at the site of inoculation of the organism, but a bacteremia soon follows which produces disseminated necrotic lesions. The neurologic manifestations either result from the severe septic state or arise from the bacterial invasion of the central nervous system. The specific cerebral lesions most commonly encountered consist of a granulomatous lymphocytic meningitis with occasional extensions of the infection into the cerebral parenchyma.

Tularemic encephalitis without preceding meningitis has been reported only once previously. A second case of tularemic encephalitis is reported which developed in the course of ulcero-glandular tularemia. The symptomatology can not yet be definitely delineated. However, focal neurologic changes and electroencephalographic abnormalities have been found, in addition to diffuse encephalitic signs and evidence of general visceral involvement.

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PUBLIC HEALTH SERVICE EXAMINATION

A competitive examination for appointment of medical officers in the United States Public Health Service will be held on May 15, 16 and 17, 1950. Examinations will be held at a number of points throughout the United States, located as centrally as possible in relation to the homes of candidates. Applications must be received no later than April 17, 1950.

Appointments will be made in the grades of assistant surgeon (equivalent to Army rank of First Lieutenant) and Senior Assistant Surgeon (equivalent to Captain).

The Diagnosis of Epilepsy

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In its Greek derivation the word "epilepsy" means to be taken with or to have seizures. Therefore, in its broad connotation the term includes any individual who has seizures. Actually there are two schools of thought on this concept, one school tending to limit the term to the narrower connotation of essential epilepsy, the other tending to include all patients with seizure manifestations and even patients with other periodic manifestations of neurologic illness such as migraine. Both are motivated by humanitarian reasons and an attempt to help patients avoid the loathesome stigma attached to the disease of epilepsy. The first group seeks to reduce the number of patients included in the diagnostic category and thereby spare more patients from the anathematous cloud, while the second group by adding in more and more patients seeks to dilute the group and so dispell the stigma. Epilepsy will be considered here on a broad basis to include all patients with convulsive manifestations, but excluding those without seizure manifestations.

The important points to be discussed are: (1) establishment of the diagnosis of epilepsy, (2) the type of the seizure present, and (3) the cause of the seizure.

Establishment of the Diagnosis of Epilepsy

As deduced from the preceding definition of epilepsy, establishment of the diagnosis consists in the determination of the presence of seizures. In the majority of cases this offers no problem for there is adequate evidence of the presence and even of the type of attacks by history from the patient and from witnesses. There are, however, certain situations where establishment of the presence of seizures is difficult indeed. These include patients who may have had a single or several nocturnal attacks when sleeping alone, with no definite history of seizure but with incontinence and tongue biting during the night, followed by drowsiness, headache and muscular aches.

The neurologist is not plagued by the difficulty of determining the epileptic origin of minor seizures, but physicians in other branches of medicine, teachers, parents and others who are unaware of the clinical manifestations of minor seizures, often ascribe these attacks to psychogenic or other factors. In the difficult diagnostic groups just mentioned, the presence of definite electroencephalographic evidence of a paroxysmal dysrhythmia is confirmatory evidence. However, a diagnosis of epilepsy cannot rest solely on electroencephalographic evidence, for clinical manifestations of seizures must be either present or highly probable.

The More Common Types of Convulsive Seizures

Generalized or grand mal seizures may be preceded by a period of premonition. This consists of difficulty in concentration, episodes of myoclonic jerkings, headache, or malaise lasting several days or as briefly as half an hour. The premonitory symptoms are not common manifestations of epilepsy. Warnings or auras occur in about one half the cases. They may be vague and indescribable, or non-focal as a feeling of a black cloud coming over the patient or a sensation of distress, rising from the epigastrium to the throat. In some patients, the aura by its very nature suggests abnormal activity of a cerebral cortical area. In these cases the aura is an auditory, visual, or uncinate hallucination. In true generalized seizures, the aura is followed by a cry and loss of consciousness. With loss of consciousness, the patient falls if unsupported and the tonic phase of the seizure begins. During the tonic phase there is muscular rigidity with the body and extremities either flexed or extended. This tonic phase may include deviation of the head and eyes either upwards, downwards, or to either side. A history of deviation of the head and eyes always to one side is suggestive of a focal cortical onset, especially if the deviation occurs before the loss of consciousness. Cyanosis, drooling of saliva, incontinence of urine and feces, involuntary ejaculation are all frequent concomitants of the seizure. In the post-ictal or post-seizure state the patient may be stuporous or present automatic activity not unlike that described below for psychomotor seizures. The generalized seizure therefore may be truly generalized with no clinical suggestion of a focal onset for the attacks. In some cases, despite the apparent generalized nature, investigation of the aura or the early phases of the attack indicate abnormal firing of one region of cerebral cortex from which the generalized attack may ensue.

Petit mal and psychomotor seizures can best be considered together, since they often present a problem in differential diagnosis. The following table presents the chief clinical points in differentiation.

Table I

Minor Epileptic Seizures

Type	*Age*	*Frequency*	*Duration*	*Seizure Type*
Petit Mal	Children	Many per day	10-60 sec.	1) Akinetic 2) Myoclonic 3) Short stare
Psychomotor	Adults	Less frequent	60+ sec.	Psychic and motor activity

The characteristics of these two types of seizures deserve elaboration. Petit mal attacks are of three types:

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(1) akinetic, a very transient attack consisting only of a sudden dropping of objects or falling of the patient, often associated with a single wave and spike component in the electroencephalogram; (2) the short stare, often described by the patient or witness as a lapse, absence or black-out, in which there is a short break in the stream of consciousness with no other manifestation; (3) the myoclonic form of petit mal attack in which the patient presents a break in the stream of consciousness, together with jerking movements of head, eyes or extremities at the rate of approximately three per second.

In psychomotor seizures, there is also a break with the stream of consciousness but psychic or motor activity is carried out. This activity while purposeful is irrelevant for time and place. Disrobing whether alone or in public is a frequent manifestation of psychomotor seizures. Bizarre activities are common. Following a psychomotor seizure, there is total amnesia for the events occurring during an attack. Certain features of psychomotor attacks connote a focal origin. These include uncinate hallucination or masticatory activities at the onset and are indicative of a temporal lobe onset. Electroencephalography may however demonstrate a temporal lobe focus in the absence of a significant focal aura.

Jacksonian seizures. The most frequent type of jacksonian seizures are motor in type. In these attacks the movements are clonic only, unilateral, and begin in one part of one extremity and march to include a part of, or the entire extremity, plus other regions of the same side of the body. Only rarely do these attacks spread to include the opposite side of the body. Loss of consciousness occurs only when the attacks become bilateral. The point of onset is in accord with the proportional representation of the parts of the body in the motor cortex. Therefore, jacksonian motor seizures commonly begin in the thumb, great toe or angle of the mouth. Spread to adjacent parts of the body follows the distribution of representation of the parts in the motor cortex.

Jacksonian sensory seizures are similar in onset and spread to their motor counterpart but are characterized by subjective sensations of dysesthesia or numbness instead of involuntary movement. These seizures originate from lesions of the post-central gyrus. Since electrical stimulation of the motor cortex yields occasional sensory responses and likewise stimulation of the sensory cortex evokes some motor responses, areas 4 and 3,1,2 can be grouped together as the sensory-motor cortex. With this in mind it is not surprising that jacksonian seizures often present both sensory and motor phenomena and may then be described as jacksonian sensory motor seizures.

Aphasia. Transitory episodes of aphasia may occur as a seizure manifestation and may be accompanied by other seizure manifestations as clonic movements of the contralateral face or even generalized seizures.

Adversive seizures consist of tonic deviations of eyes, or eyes and head, to the side opposite the lesion. Adversive seizures may occur alone and be unassociated with loss of consciousness or, as noted previously, may be a part of a generalized seizure.

Hallucinatory seizures are auditory, visual or uncinate in type. The visual images and sounds are most frequently poorly formed but in some cases are highly integrated.

Establishment of the Cause of the Epilepsy

There are two chief types of epilepsy, the essential or idiopathic and the symptomatic types. The essential type includes the cases with a genetic background, non-focal types of seizures, and bilateral electrical cortical dysrhythmias. The symptomatic type includes the cases arising on the basis of a focal cerebral disease or a general medical disease. The differentiation into these two types of epilepsy is based on the following factors: age of onset, family history of epilepsy, the type of seizure, duration of seizures, the presence of a disease capable of producing seizures and the electroencephalographic evidence of focal or general dysrhythmia.

The age of onset is important (Table II) in that seizures beginning between the ages of 10 and 30, and especially between 10 and 20, are more likely to be idiopathic in type than seizures having their onset at other times in life. A positive or negative family history of epilepsy is not a definitive diagnostic point for idiopathic vs. symptomatic epilepsy, but the presence of a positive family history makes more tenable the diagnosis of idiopathic epilepsy.

Table II [1]

Age of Onset, Year		*Presumptive Cause*
Infancy	0-2	Birth injury; degeneration; congenital
Childhood	2-10	Birth injury; febrile thrombosis; trauma; idiopathic
Adolescence	10-20	Idiopathic; trauma
Youth	20-35	Trauma; neoplasm
Middle Age	35-55	Neoplasm; trauma; arteriosclerosis
Senescence	55-70	Arteriosclerosis; neoplasm

The type of seizure is a strongly indicative point between idiopathic and symptomatic epilepsy. Table III presents the seizure type viewed on the basis of the type of epilepsy. Certain types of seizures are indicative of idiopathic epilepsy. Petit mal seizures with electroencephalographic correlation are idiopathic. Only very rarely may petit mal seizures be seen as the result of a focal lesion to one orbital gyrus. Generalized seizures without focal components are usually idiopathic but not necessarily so. The duration of seizures is not a very

Table III

Types of Seizures Occurring in Idiopathic and Symptomatic Epilepsy

Idiopathic	Petit Mal Generalized seizures without focal components
Either idiopathic or symptomatic	Psychomotor seizures Generalized seizures with focal components
Symptomatic	Adversive seizures Jacksonian seizures Hallucinatory seizures

useful point in differentiating between idiopathic and symptomatic epilepsy, but general seizures which have been present 10 years or longer are seldom due to brain tumors.

The presence of certain disease entities favors the diagnosis of symptomatic rather than idiopathic epilepsy.

TABLE IV

Diseases Producing Seizures.

Congenital defect		
Brain injury	birth post-natal	meningo-cerebral scar hematoma
Brain tumor		
Cerebral infection	syphilis-paresis post-meningitic scarring brain abscess encephalitis	
Cerebro-vascular disease		
Spontaneous hypoglycemia		
Cardiovascular disease	carotid sinus sensitivity Stokes-Adams syndrome orthostatic syncope	

Table IV presents the most important of these disease entities. We can not here discuss the differential diagnosis between these various entities for that entails much of the field of clinical neurology and facets of general medicine as well. Since seizures may be the first or even the only clinical manifestation of some of these disease entities, it is obvious that while the presence of such a disease in a patient with seizures suggests the epilepsy is symptomatic, the converse is also true and the presence of seizures makes it necessary for the examiner to be certain that one of these disease entities is not present.

The differential diagnosis between symptomatic and idiopathic epilepsy rests upon a careful history of the types of seizures and the subjective and objective components of the attack, the history of onset, duration and family history as outlined, careful neurologic examination and finally laboratory studies. The most important of the laboratory studies is electroencephalography.

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INTERNATIONAL HOSPITAL INSTITUTE

In order to make the latest methods and techniques of hospital administration known throughout the Americas, the Third International Institute on Organization and Administration of Hospitals will be held in Rio de Janeiro in June 1950. Leading educators in hospital work from nine countries, internationally known as authorities on hospital matters, will lecture on the most recent systems and methods in order to improve the standards and exchange of information available today on the subject.

Twelve institutions interested in the development of hospital service have joined nineteen official agencies of the Brazilian Government in the organization of this meeting which will be held in the Ministry of Education of Rio, beginning June 18 and closing July 1, 1950.

Officers of the Pan American Sanitary Bureau—Regional Office of the World Health Organization, the Inter-American Hospital Association, the Ministry of Education and Health and the National University of Brazil, have officially announced the meeting which is open to all countries, and during which the lectures will be given simultaneously in Portuguese, Spanish and English, with the use of the IBM wireless translating equipment.

Medical Therapy of Epilepsy

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Elimination of causative or precipitating factors when possible and regulation of physical and mental hygiene are an important part of the treatment of epilepsy. Success in management of the majority of cases, however, depends on the ability of the physician to control seizures with anticonvulsant drugs.

The first rational pharmacological approach to the treatment of epilepsy began with the use of bromides by Locock in the middle of the nineteenth century. They remained for a long time the only adequate anticonvulsant medication. In 1912 Hauptmann demonstrated the effectiveness of phenobarbital as an anticonvulsant, and thereafter use of bromides gradually decreased because of their many undesirable side effects. They are now used only occasionally.

While phenobarbital is an excellent anticonvulsant drug, its use is limited by its hypnotic side effects. At the present time it is employed primarily in patients with infrequent seizures or used in combination with other anticonvulsants.

Between 1921 and 1937 great stress was laid on metabolic factors in the therapy of epilepsy and the importance of acidosis [1] and a negative fluid balance [2] was emphasized. Wilder [3] and subsequently many others [4,5,6] demonstrated that acidosis resulting from a ketogenic diet was effective in reducing the frequency of seizures. However, the difficulty in maintaining an acidosis and the hardships inherent in the ketogenic diet have limited its use. Likewise, excessive restriction of fluid necessary to maintain a negative fluid balance has prevented wide acceptance of dehydration therapy.

A new method of testing the anticonvulsant activity of drugs in animals was reported by Putnam and Merritt [7] in 1937. Over 700 compounds have been tested by this method, the most outstanding being 5,5 diphenylhydantoin (dilantin). Results obtained in the treatment of 200 patients with this compound were first reported by Merritt and Putnam [8] in 1938. Since that time the efficacy of 5,5 diphenylhydantoin in preventing convulsive seizures in humans has been confirmed by many observers.[9,10,11] It is now generally recognized as the most effective agent for prevention of grand mal and psychomotor seizures available at the present time.

While 5,5 diphenylhydantoin is an extremely effective agent in the treatment of grand mal and psychomotor attacks, it does not have any appreciable effect on petit mal nor does it prevent occurrence of grand mal or psychomotor seizures in all patients. In addition, certain untoward side reactions of the drug, such as ataxia, nystagmus, gastric distress, hypertrophy of the gums and skin rashes, make it impossible in some cases to administer an effective dose of the drug.

In 1945 Loscalzo [12] reported that methylphenylethyl hydantoin (mesantoin) was an effective anticonvulsant in the treatment of grand mal seizures. Results obtained with this compound have been confirmed by other investigators.[13] However, this compound, too, is ineffective against petit mal and against many cases of grand mal and psychomotor seizures. In addition, methylphenylethyl hydantoin has now been in use long enough to demonstrate that it possesses graver toxic effects than originally noted. There have been recent reports [14,15,16] of four cases of severe aplastic anemia with death in two. One other patient died of a fulminating dermatitis bullosa after having taken methylphenylethyl hydantoin for 12 days.[17]

Lennox [18] reported in 1945 the results of an extensive trial of 5,5,5-trimethyloxazolidine-2,4-dione (tridione) in the treatment of the petit mal triad. Favorable results with tridione have also been reported by other observers.[19] Although it is undoubtedly the most effective drug available at the present time for the treatment of petit mal seizures, tridione, too, has certain grave toxic effects. There have been 3 fatal cases of pancytopenia [20,21,22] and 2 cases of nephrosis [23,24] reported following use of this drug. Other fatalities not recorded in the literature have been reported to the authors.

Six New Compounds

All the anticonvulsant drugs now in use have some drawback, and there is a constant search for some new compound which will be effective against all types of convulsive seizures and which will not have undesirable side effects. We have had occasion to give 6 new compounds (5 methyl, 5 phenyl hydantoin; 5 isopropoxymethyl-5-phenylhydantoin; 5,5 diphenylene hydantoin; ethyl phenyl sulfone; 5 thienyl-5 phenylhydantoin; and phenylacetylurea) a fairly extensive trial in refractory cases of epilepsy. With few exceptions most of the patients who received these new drugs were those whose seizures were uncontrolled by the established anticonvulsants. In most cases the new compound was added to the medication that the patient was already taking.

5 Methyl, 5 Phenyl Hydantoin:

This compound was administered to 41 patients for periods ranging from five days to one year. In 26 of the 41 patients it was given for a sufficiently long period to be able to evaluate its anticonvulsant activity (Table 1). The attacks were entirely controlled in nine (35 per cent), reduced in frequency in ten (38 per cent), unchanged in six (23 per cent) and increased in frequency in one (4 per cent). The anticonvulsant activity of the compound could not be evaluated in the remaining 15 patients due to occurrence of an allergic dermatitis in 14 and gastrointestinal symptoms in one.

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The beneficial effects of this compound were greatest when the seizures were of the grand mal or psychomotor type. It was given to only a few patients with petit mal seizures and in one of these, the attacks were increased in frequency.

The drug was given in doses varying from 0.4 to 1.0 grams daily. Three patients developed a mild degree of gastric distress. Fourteen of the 41 patients (34 per cent) developed a skin rash. In 12 of the 14 patients with a skin reaction, the rash was of a scarlatiniform or morbilliform nature and appeared 5 to 10 days after treatment was started. In two patients the rash took the form of an exfoliative dermatitis which appeared about 10 days after use of the drug. In one of these patients there was also a severe eosinophilic reaction in the blood with displacement of the red cells in the bone marrow and a severe anemia.

TABLE 1

The Anticonvulsant Activity of 6 New Compounds

Compound	No. of Cases	Attacks				Type of Seizure benefitted	Toxic Effects
		Controlled	Reduced in frequency	Unchanged	Worse		
		%	%	%	%		
5 methyl, 5 phenyl hydantoin	26	35	38	23	4	Grand mal and psychomotor	Allergic dermatitis Anemia
5-isopropoxymethyl-5-phenylhydantoin	25	0	0	0	0	None	None
5,5 diphenylene hydantoin	36	14	19	67	0	Grand mal and psychomotor	Ataxia, nystagmus, diplopia, dysarthria. Allergic dermatitis
Ethyl phenyl sulfone	25	0	16	84	0	Grand mal	Slight ataxia
5-thienyl-5-phenyl-hydantoin	23	9	35	56	0	Grand mal and psychomotor	Itching sensation, ataxia, nystagmus, dizziness, diplopia, nausea and vomiting, rash, tongue plaques
Phenylacetylurea	60	0	38	57	5	Grand mal, psychomotor and few petit mal	Gastrointestinal disturbances, jaundice, rash, emotional upsets, lethargy, sleeplessness, depressed wbc.

It would seem from the results obtained with administration of 5 methyl, 5 phenyl hydantoin that this compound has an anticonvulsant activity equal or superior to that of 5,5 diphenylhydantoin or phenobarbital. Seizures were either controlled or reduced in frequency in 19 of the 26 patients (73 per cent) who had previously been treated with the latter drugs. The toxic side effects of this drug make it unsuitable for general use in its present form.

5-Isopropoxymethyl-5-Phenylhydantoin:

This compound was given to 25 patients for periods varying from one to three months in duration (Table 1). There was no significant change in the frequency of seizures as a result of administration of this compound. There was a transient reduction in frequency of attacks in a few patients but this improvement was not maintained. No toxic side effects were noted from the administration of the compound in dosages varying from 0.4 to 20 grams daily.

5.5 Diphenylene Hydantoin:

This compound was administered to 43 patients over periods varying from 2 weeks to 35 months (average 6 months). It was possible to evaluate the efficacy of the anticonvulsant in 36 patients (Table 1). In the remaining seven, anticonvulsant effect of the compound could not be determined because extended administration was prevented by appearance of a toxic skin reaction or because follow-up data were inadequate or unreliable.

Thirty-one of the 36 patients had been refractory to other forms of therapy while in five the 5,5 diphenylene hydantoin was the first form of therapy. In the 31 patients who had been treated with 5,5 diphenylhydantoin and phenobarbital, the attacks were entirely controlled in three (8 per cent), greatly reduced in frequency in five (14 per cent), and not significantly affected in 23 (78 per cent). The reduction in frequency was seen in grand mal or psychomotor attacks. There was no effect on the frequency of petit mal attacks in the three patients who were subject to that type.

Of the five patients who had not received any adequate treatment previously two had a complete remission (both in their grand mal and petit mal attacks) and two had a great reduction in the frequency of seizures. There was a temporary remission in the attacks of the remaining patient but later there was a recurrence at their previous frequency. All five of these patients had frequent attacks and were treated with 5,5 diphenylene hydantoin for seven months or more.

The dosage administered varied between 0.4 and 2.3 grams daily. The symptoms of excessive dosage consisted of ataxia, nystagmus, diplopia and dysarthria. The majority of adults were able to tolerate 1.7 grams daily without developing these symptoms although an occasional patient could not.

An allergic dermatitis developed in seven of the 43 patients (16 per cent) taking 5,5 diphenylene hydantoin. The rash usually appeared 8 to 21 days after the first dose (average 10 days). It was usually morbilliform, occasionally scarlatiniform, and was often accompanied by fever, headache, malaise, nausea and vomiting. Administration of 5,5 diphenylene hydantoin was resumed after the rash disappeared in four of the seven patients. Three were then able to continue taking the drug regularly and in adequate dosage, while the fourth patient noted a prompt reappearance of toxic symptoms necessitating withdrawal of the drug again.

From the results obtained with the administration of 5,5 diphneylene hydantoin, it would seem that this compound has a definite anticonvulsant activity. It is not superior to 5,5 diphenylhydantoin and phenobarbital in refractory cases, however.

Ethyl Phenyl Sulfone:

This compound was administered to 25 patients for periods varying from one week to seven months (Table 1). Complete relief of attacks was not obtained in any of 25 patients, with four (16 per cent) showing a reduction in frequency of seizures and 21 (84 per cent) having no appreciable change in frequency.

No significant toxic side effects were noted after administration of ethyl phenyl sulfone in the dosage used, i. e., 0.6 to 1.6 grams daily. In three patients there was a slight degree of ataxia when taking over 1.0 grams daily.

5-Thienyl-5 Phenylhydantoin:

5-Thienyl-5 phenylhydantoin was administered to 36 patients for periods ranging from two weeks to nine months. All of these patients had previously been treated with various anticonvulsant drugs, including 5,5 diphenylhydantoin, phenobarbital, either alone or in combination, and had not been relieved of their seizures by these forms of medication.

This compound was given to 23 of the 36 patients for a sufficiently long period to evaluate its anticonvulsive activity (Table 1). The attacks were entirely controlled in two (9 per cent), reduced in frequency in eight (35 per cent), and unchanged in 13 (56 per cent). In the remaining 13 patients it was not possible to estimate anticonvulsant effect accurately because prolonged administration was halted after appearance of toxic reactions or because follow-up data were inadequate or unreliable.

Reduction in frequency occurred in grand mal or psychomotor attacks. One patient who had myoclonic jerks in addition to grand mal seizures had a reduction in the frequency of both types of attacks. No effect was noted on the frequency of the petit mal attacks in the four patients in this group who were subject to this type of attack.

The dosage administered varied between 0.25 and 1.4 grams daily. The appearance of itching sensations, ataxia, nystagmus, dizziness, diplopia, and nausea and vomiting made it necessary to discontinue the drug in six patients. In one the drug was discontinued due to appearance of a morbilliform rash 2½ months after initiation of treatment. It was discontinued in another patient because of the appearance of tongue plaques 3½ months after treatment was begun.

The results obtained with the use of 5 thienyl-5 phenylhydantoin indicate that, while this compound has a definite anticonvulsant activity, it is not superior to 5,5 diphenylhydantoin and phenobarbital in the treatment of refractory cases. In order to determine better its anticonvulsant efficacy in comparison to 5,5 diphenyl hydantoin or phenobarbital, it should be tested in a larger group of patients not previously shown to be refractory to those drugs.

Phenylacetylurea (Phenurone):

This compound was given to 87 patients with all types of convulsive seizures for periods ranging from two weeks to seven months. In all cases phenurone was added to the medication that the patient was already taking (5,5 diphneyl hydantoin, methylphenylethyl hydantoin and phenobarbital).

It was possible to evaluate the anticonvulsant activity of phenylacetylurea in 60 of the 87 patients (Table 1). In none of these cases were attacks controlled completely. They were reduced in frequency in 23 patients (38 per cent), unchanged in 34 (57 per cent) and made worse in three (5 per cent). Anticonvulsant effect could not be determined in the remaining 27 patients because prolonged administration of the drug was prevented by appearance of toxic reactions or because follow-up data were inadequate or unreliable.

When effective, the compound reduced frequency of grand mal and psychomotor attacks. It was slightly more effective in the latter than in grand mal seizures. There was some reduction in the frequency of petit mal attacks in four of the 19 patients with such seizures.

The drug was given in a daily dosage varying from 0.5 to 6.0 grams daily. In 15 patients the compound had to be discontinued because of the severity of the toxic reactions. In six of the 15 patients, gastrointestinal symptoms (anorexia, nausea, vomiting, diarrhea, abdominal distension and pain) appearing 7 days to 8 weeks after initiation of treatment necessitated discontinuation of the medication. Jaundice developed in two patients 2 and 6 weeks after treatment was started. In two others morbilliform rash developed 7 and 14 days after treatment was begun. In the remaining five patients the drug was discontinued because of fears of death and nervousness, chest pain and inability to concentrate, ataxia, lethargy and inability to sleep and a depression of the white blood count.

Our experience with phenylacetylurea would indicate that this compound has some anticonvulsant activity, but that it is not superior to 5,5 diphenyl hydantoin and phenobarbital in the treatment of refractory cases.

SUMMARY AND CONCLUSIONS

The successful management of the majority of patients with convulsive seizures depends on the ability of the physician to control these attacks with anticonvulsant drugs. The value of such compounds as phenobarbital, 5,5 diphenylhydantoin (dilantin), methylphenylethyl hydantoin (mesantoin), tridione, and the bromides is well recognized, but all have some drawbacks. Six new compounds: 5 methyl, 5 phenylhydantoin, 5 isopropoxymethyl 5-phenylhydantoin, 5,5 diphenylene hydantoin, ethyl phenyl sulfone, 5 thienyl-5 phenylhydantoin, and phenylacetylurea—have been given a fairly extensive trial in the treatment of cases that did not respond to the established anticonvulsants.

Four of these compounds, 5 methyl, 5 phenylhydantoin, 5,5 diphenylene hydantoin, 5 thienyl-5 phenylhydantoin and phenylacetylurea have anticonvulsant activity. Of this group only 5 methyl, 5 phenylhydantoin proved more effective than the usual anticonvulsant drugs, either controlling or reducing the frequency of seizures in 73 per cent of cases in which it was administered. High incidence of allergic skin reactions makes its use impractical in its present form, however.

At the present time 5,5 phenylhydantoin is the safest and most effective compound for the treatment of grand mal and psychomotor seizures. Tridione is the most effective drug for the treatment of petit mal seizures.

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PREVENTABLE BLINDNESS CAMPAIGN

A $500,000 budget for an intensified campaign against preventable blindness has been adopted as the 1950 objective of the National Society for the Prevention of Blindness. Plans call for a stepped-up program on two major fronts: preventive education and service, and research.

An estimated 22,000 men, women, and children will become blind in the United States during the coming year, though 50 to 75 per cent of this blindness could be prevented.

In the schools, 4,500,000 children have some form of visual defect, but only a fraction of these cases are being found and treated, according to the society. Further, they report that 800,000 persons over 35 have unrecognized glaucoma, a disease that causes almost certain loss of vision unless treated.

The Treatment of Tetanus

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Most of the current concepts of the pathogenesis of tetanus agree that its development is dependent upon multiplication of the organisms and production of a soluble toxin. It is this toxin which produces the symptoms. The mechanism by which toxin reaches the nervous system is still controversial. The older theory of Myer assumed that toxin passed along the peripheral nerve axes. This explained the fact that when the site of injury was more remote, the incubation period tended to be longer, and also explained the phenomenon of local tetanus. However, a series of systematic and careful experiments by Abel and his co-workers [1] showed conclusively that the spread of toxin is probably by the hematogenous route. Further evidence for a hematogenous spread comes from histological studies. It has been shown that a perivascular demyelination occurs if the disease has been present for five days or more.[2] Histologic as well as experimental studies support the view that symptoms in this disease may result from the involvement of certain groups of motor cells, probably accounting for the clonic spasms. Experimental evidence also suggests that in tetanus there may be some involvement of the myoneural junction, central synaptic mechanism, and the cholinesterase-acetyl-choline system.[3]

According to Abel's experiments, serum therapy is powerless to mitigate or abolish the lethal effect of the tetanus toxin once a certain dose has been fixed by the nervous system. On the basis of cross circulation experiments, Firor [4] felt that this fixation of the toxin within the nervous system resulted in the production of a second toxin which would not respond to tetanus antiserum. The ideal treatment, therefore, would be to combat the fixed toxin or to neutralize Firor's secondary toxin, if such exists. Such a therapeutic agent is not available. Accordingly, the treatment has centered about controlling the manifestations and preventing their progression to a fatal issue.

Table 1

Causes of Death in Eleven Fatal Cases (Eight Autopsies)

Exhaustion and/or Medullary	Laryngeal spasm	Toxic Encephalitis	Pneumonia
8	5	3	4

A knowledge of the usual causes of death in this disease is most essential to any consideration of treatment. In tetanus death usually results from one of five causes, namely: spasm of the glottis, diaphragm and intercostal muscles resulting in asphyxia; toxic encephalitis; exhaustion; medullary failure; secondary pulmonary infection.

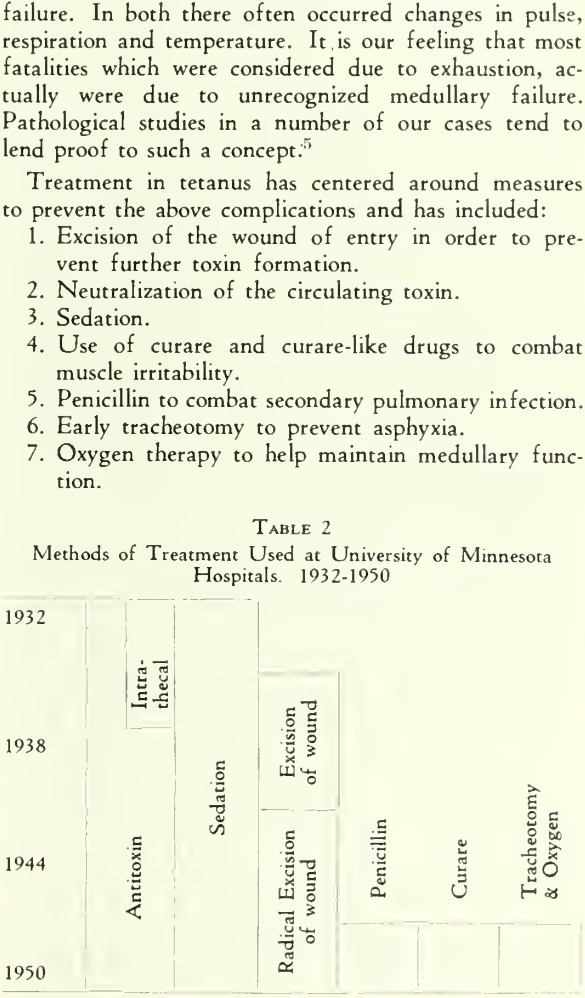
In a number of our cases it was most difficult to distinguish between death from exhaustion and medullary failure. In both there often occurred changes in pulse, respiration and temperature. It is our feeling that most fatalities which were considered due to exhaustion, actually were due to unrecognized medullary failure. Pathological studies in a number of our cases tend to lend proof to such a concept.[5]

Treatment in tetanus has centered around measures to prevent the above complications and has included:

1. Excision of the wound of entry in order to prevent further toxin formation.
2. Neutralization of the circulating toxin.
3. Sedation.
4. Use of curare and curare-like drugs to combat muscle irritability.
5. Penicillin to combat secondary pulmonary infection.
6. Early tracheotomy to prevent asphyxia.
7. Oxygen therapy to help maintain medullary function.

Table 2

Methods of Treatment Used at University of Minnesota Hospitals. 1932-1950



The trend of treatment in tetanus has varied considerably over a period of years. However, there has always been an apparent attempt to combat one or another of the various causes of death by current techniques. This trend in therapy can be readily visualized in Table 2, which summarizes the methods of treatment at the University of Minnesota Hospitals since 1932.

Excision of the Wound: Since the tetanus bacillus produces its toxin from a focal area, it would seem logical to radically remove the focus of infection and thereby prevent further manufacture of the toxin. Opinions in the literature as to the efficacy of this procedure have been controversial. A number of investigators [1,6] have observed experimentally that the course of the disease is not materially affected by excising the wound. Spaeth [7] believes that the risk of stimulating the patient is sometimes an important deterrent to this procedure. If the present concept of the pathogenesis of this disease is correct, then it would seem to be most essential to radically remove the focus of infection whenever such a focus can be found. Since 1938, we have tended to be more radical in our removal of the wound. It must be taken into consideration, however, that there will be many cases in which no focus can be found and such patients will be treated without the apparent benefits of such a procedure.

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Neutralization of the Circulation Toxin: Extensive experiences with seroprophylaxis in World War I [8] confirmed clinically the experimental work of Kitasato [9] as to the beneficial effects of antiserum on the tetanus toxin. Opinion has differed with respect to use of serum once symptoms have developed. Experimentally it has been shown that once a lethal dose has been fixed by nervous tissue, antitetanic serum is powerless to mitigate the course of the disease.[10] Since, for practical purposes, it is impossible to determine if this has occurred clinically, it has been thought advisable to give adequate antitoxin to all patients suffering from this disease. Based on the results of serial titration specimens, Spaeth [11,7] has recommended as a reasonable schedule the administration of 60,000 units during the first 24 hours and 20,000 to 40,000 units daily for the next few days. With the newer tendency to radically remove the focus of infection it would not seem necessary to maintain a high serum level of antitoxin for any length of time. Where the wound is extensive and cannot be completely removed, or where the focus cannot be found, a larger dose and a longer period of administration would logically be indicated. In our cases the dosage has varied from 40,000 to 200,000 units daily over a period of from a few days to several weeks, depending on these factors.

Intraspinal serum was used here prior to 1938 but has been gradually discarded because of the dangers incumbent in its use [12] and the lack of proof that it has any advantage over the parenteral route.

Sedation: Environmental and pharmacologic sedation has been repeatedly cited as the corner stone of treatment. Bryant and Fairman [13] treated 22 patients with sedation alone and had only five deaths, a very low rate and contrary to most reports in the literature. Absolute quiet, a dark room and sedation have been considered of great importance in preventing and controlling the muscle hyper-irritability occurring in this disease. The most popular drugs for this purpose have been avertin, the barbiturates, chloral hydrate, and paraldehyde. The great disadvantage to these drugs is that in the more severe cases, doses which control the symptoms also greatly suppress respiration and predispose to respiratory infections. The barbiturates have been shown to reduce the life span of experimentally infected animals.[4] In many patients, however, the barbiturates, chiefly amytal, have proven very useful.

Paraldehyde, in our experience, has been one of the best drugs when administered rectally, orally, or intramuscularly with alteration of the routes because of its irritative properties. The dosage must be regulated according to the response of the patient and can frequently be reduced if curare and other such drugs are used concomitantly.

Curare and Curare-like Drugs: It is not suprising that Claude Bernard, who showed that curare had its primary action at the myoneural junction, should have suggested that this substance be used in the treatment of tetanus. The first case was treated by Hoche [14] in 1894. Sporadic cases were reported in the literature but the method was greatly hindered by the lack of any standardization of the substance. Subsequent to the crystallization of a highly active d-tubocurarine chloride [15] in 1935, several papers have appeared [16,17,18] on its use in tetanus. Intravenous injection of the substance was reported to relieve the excruciating pain of the muscle spasms in a matter of seconds. To quote one author,[18] "One could see the jaw relax, the opisthotonos disappear, and the respirations become easier."

Curare possesses certain theoretical advantages over the sedatives previously used since it permits relaxation without the prolonged respiratory depression and interference with vegetative functions which was present with the usual sedatives. Since curare paralyzes the intercostals prior to the diaphragm, it could at least theoretically release tonic fixation of the chest without complete paralysis of the respiratory musculature. However, at the onset, the use of curare was somewhat impracticable, since it had to be given intravenously and its action was very short. This necessitated very frequent injections and continuous attention by the physician in order to combat toxicity and the side effects of hypersecretion and bronchospasm.

More recently, a suspension of curare in wax and oil, similar to that used by Romansky and Rittman [19] for penicillin has been used in the treatment of various spastic conditions by Schlesinger.[20] He observed no undesirable side effects in 1500 injections. Weed and Purvis [21] reported the use of this drug in three cases of tetanus. All of the patients had generalized muscular spasms and two of the three had tetanic convulsions. The authors used a preparation (Squibb) containing 175 units of d-tubocurarine in 4.8 per cent wax and oil. The dosage of the drug varied between 0.75 and 2.0 cc. daily. The effect from one intramuscular injection was apparent within an hour and lasted about twenty hours. They encountered no serious toxic effects. EKG's were normal and no clinical cardiac dysfunction occurred. All patients lived. We have used curare in the treatment of three cases. While in all the cases there seemed to be some subjective relief, in only one case was it possible to form any definite conclusions. In one case it was felt that the amount of sedation required was considerably reduced by the concomitant use of curare.

Godman and Adriani [22] have recently reported some success with myanesin although their dosage seems to be small. On the neurology service of the University Hospitals, in an occasional case, a combination of curare and pentothal, known as Baird's solution,[23] has been used. This solution represents an attempt to combine the relaxing effects of the sedatives with that of the curare-like drugs.

Penicillin: Knowledge that penicillin inhibited growth of clostridium tetani naturally stimulated interest in the effect of the antibiotic on the disease. It is generally agreed that the organism remains at the site of the wound, multiplies, and produces its toxin locally. However, recovery of the organism from various organs in four fatal cases by Mayer indicates that a bacteremia may occur. The experiments of Neter [24] would seem to show that the antibiotic fails to protect animals against the toxin itself.

Several reports of small series of patients treated with penicillin [25,26,27,28] have been published with statements that in the cases discussed the drug "would seem" to be or "is apparently" life saving or beneficial. All were uncontrolled cases and one cannot draw any conclusions from them. Altemeier [29] reported 16 cases in which the drug had no effect. Diaz Rivera [30] and his co-workers reported some benefits from penicillin in 59 cases. However, the difference in mortality between the treated and untreated cases was less than 3 per cent and is therefore of questionable significance. Generally, it appears that penicillin has very little effect upon the disease itself. Use of this drug is of utmost importance, however, in combating the secondary pulmonary complications that often prove fatal to the patient. It is for this purpose that we have instituted the routine use of penicillin in all cases of tetanus admitted within the past few years. Because of its wider antibacterial spectrum, the use of aureomycin is probably indicated for this latter purpose also.

Tracheotomy and Oxygen Therapy: In 1942 Baker [5] demonstrated marked nerve cell changes in certain cell groups in the medulla in tetanus. While the clinical signs and the mode of death in this disease had often seemed consistent with medullary failure, and Firor [4] had noted that his experimental dogs appeared to die primary respiratory deaths, this cause had previously been given little consideration. Moreover, even under the best regulation of sedation it is often impossible to totally avoid acute laryngospasm which acts as a constant threat of death from asphyxia and can seldom be averted by intubation because of the coincident trismus.

Primary vital medullary center involvement in poliomyelitis has been observed and described on our service several times in the last three years.[1,2] Superimposed hypoxia which resulted from partially obstructed airways has always been followed by more marked and frequently irreversible involvement. We have been convinced that the institution of early tracheotomy and supplemental oxygen therapy have been of great value in preventing this occurrence.

It is reasonable to suppose, by analogy to poliomyelitis, that hypoxia would also have a detrimental effect on diseased nerve cells in tetanus. Accordingly within the past year we have instituted early tracheotomy in order to avoid hypoxia to the medulla and to insure an adequate airway in the event of spasm of the laryngeal muscles. Also the presence of a tracheotomy facilitates the administration of continuous oxygen, thus giving an added safety factor. We wish to emphasize the early and elective nature of this procedure.

CONCLUSIONS

In view of the above discussion it is our feeling that the most effective treatment of the tetanus patient at the present time should include the following points:

1. *Environmental Sedation:* The patient should be placed in a cool, dark room, situated in that part of the ward most remote from extraneous noises. Furniture and bedclothing should be kept at a minimum and visitors should be forbidden. A special nurse should be in constant attendance. Nursing care in tetanus will be described in detail in a forthcoming publication from the Division of Neurology.[33]

2. *Pharmacologic Sedation:* While this may be induced with any one or more of a variety of drugs, we have preferred paraldehyde because the degree of sedation is easily controlled and complications accompanying its use are few. A standard dosage cannot be prescribed, but will depend upon the clinical response of the patient, making frequent observation of the patient by the attending physician mandatory.

3. *Excision of the Wound:* The wound should be completely and widely excised, preferably under general anesthesia to avoid precipitation of spasms. The tissue surrounding the wound should be infiltrated with antitoxin immediately prior to surgery. Pentothal is probably the anesthetic of choice since the excitement phase of induction is eliminated and adequate oxygenation is maintained.

4. *Antitoxin:* Immediately after the diagnosis has been made the patient should be tested for sensitivity to horse serum and antitoxin administration begun, the initial dosage depending upon his response to the sensitivity tests. We feel that at least 100,000 units should be administered by the intravenous route daily for the first two or three days. Subsequent dosage will depend upon whether or not the physician feels that the focus of infection has been completely eradicated surgically. If he feels that excision was incomplete, that there may be other foci, or if no focus was found, then large daily dosage should be continued until the illness is terminated.

5. *Early Tracheotomy:* Tracheotomy should be performed at the first evidence of tonic spasms. It should never be delayed until the patient has periods of apnea and cyanosis, for the added effect of hypoxia upon the diseased nervous system may produce irreversible medullary damage. Oxygen should be administered under positive pressure through the tracheotomy tube during the acute phase of the illness. Frequent removal of secretions by suction through the tube is usually necessary.

6. *Penicillin:* Penicillin is administered to prevent pulmonary infections. Specific dosage is speculative.

However, we give approximately one million units daily in divided doses.

7. *Curare:* We feel that the administration of drugs with a curare-like action is definitely effective in promoting muscular relaxation and reducing the quantities of sedative drugs required. The best drug available to date is d-tubocurarine in oil. There is individual variation in adequate dosage, depending upon the size of the patient, severity of muscular spasm, etc. On the average, we have found that approximately 1.5 cc. injected once daily produces considerable relaxation without toxic symptoms. An ampule of prostigmine should be kept in the room and ready for immediate use at all times in the event that the patient becomes overcurarized.

8. *Miscellaneous:* Supportive therapy must of course be carried out as with any acutely ill patient. It should be pointed out that insertion of the gastric tube for feeding purposes should never be attempted unless tracheotomy has previously been performed because of the danger of exciting laryngospasm. If tracheotomy has not been performed, a syringe with pentothal of amytal should be kept constantly available in the event that the patient has a sudden spasm of the laryngeal muscles or those of the thoracic cage.

Although our present experience with each of the above treatment procedures is limited, we feel that their application in the patients treated by us has indicated their efficacy.

TABLE 3
Mortality in Relation to Type of Treatment

Type of Treatment	No. of Cases	Mortality Per Cent
Sedation and Antitoxin	12	67
Sedation, Antitoxin and Excision	7	60
Sedation, Antitoxin, Excision and Penicillin	2	50
Sedation, Antitoxin, Excision, Penicillin, Curare, and Tracheotomy	3	33

Two of the last patients treated were extremely ill for a long period of time and still survived. Obviously, it will take a large series of cases to completely justify our optimism with the above suggested methods of treatment. Nevertheless, we cannot help but feel that more rigid attention to the medullary complications by means of tracheotomy and oxygen therapy will help reduce the fatalities in this disease.

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NATIONAL NEGRO HEALTH WEEK

April 2nd to 9th has been designated as the nation's Negro Health Week. Booker T. Washington, whose birthday is observed April 5, is revered as the founder of both Tuskegee Institute and National Negro Health Week. Next year will be Tuskegee's seventieth anniversary. National Negro Health Week has been observed about half that time, thirty-six years.

The Central Action of Procaine Hydrochloride

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Since the adoption of procaine hydrochloride as a local anesthetic, it has been assumed that certain untoward effects can be attributed to its accidental introduction into the general circulation and subsequent entrance into the central nervous system. The convulsions are indicative of cortical irritation and depression, and the respiratory failure may be correlated with the acknowledged myasthenic effect.

The revolutionary deliberate intravenous injection of procaine for its central effect is credited to Robert Barany, who attempted to treat tinnitus aurium with intravenous injections of several local anesthetics and reported his results in 1935. R. W. Lewy, who followed up this work and made his report in 1937, emphasized the central effect as the only explanation for the relief of tinnitus.

The central or toxic effect of procaine is usually seen when it is injected intravenously, rapidly or in concentrated solution. The symptoms are numerous and can be studied best in tabular form. Their general resemblance to the symptoms of lesions of the thalamus and of the intraventricular injection of drugs which influence the intact thalamus is remarkable.

Table 1

Symptoms which have been observed with intravenous injections of procaine. The symptoms which resemble those described in diencephalic autonomic epilepsy are marked with asterisk.

Cerebral
Confusion
Convulsion
*Unconsciousness
Aphasia
Inebriety

Hypothalamic
Anxiety
Rage
Excitement
Euphoria
Motor restlessness
Push of speech
Flight of ideas
Hallucinations

Autonomic
*Staring
*Mydriasis
Nausea
Vomiting
Paleness
*Flushing
*Lacrimation
Diuresis
*Tremor
Dry mouth

Myasthenic
Weakness
Tiredness
Areflexia
Respiratory paralysis
Numbness
Dysarthria

Unclassified
Numbness
Allergic shock
Tinnitus
Dizziness
Vertigo
Metallic taste

The experimental investigation of the action of procaine has been directed mainly to its curare-like effect on the myoneural junction and to its interference with the transmission of impulses in autonomic ganglia. The clinical investigation of the central effect has been limited to observation of the symptoms accompanying intravenous injections. We have attempted to correlate our observations with serial electroencephalograms.

We are by no means pioneers in treating nervous diseases with intravenous injections of procaine. Since the initial work of Barany and Lewy, encouraging results have been reported with Raynaud's disease, cerebral edema, carbon monoxide poisoning, hysteria, and status epilepticus. This does not include the relief of pain, pruritus, and muscle spasm in which the mechanism is at least partly neurogenic.

The basis of our selection of patients has been severe cerebral dysrhythmia, especially of the slow frequency, high amplitude type. The electroencephalogram is seriously but transiently abnormal in metabolic disturbances, particularly with deficiencies of oxygen, carbon dioxide and glucose. It may be permanently altered in cases of severe trauma to the brain, in meningo-encephalitis and in some degenerative conditions. It is also grossly abnormal in some acute psychomotor disorders (excitement, confusion, convulsion) with complex etiology. These disorders have a tendency to recurrence and to self-perpetuation, yet they do resolve, with or without evident cause. The recovery is usually coincident with improvement in electroencephalographic rhythms, although normality of rhythm does not necessarily mean clinical recovery.

Report of Cases

Case 1: J. T., a man aged 41, with history of excessive drinking and repeated head injury. Alcoholic indulgence followed by convulsions and severe headache. Four intravenous injections of procaine hydrochloride with clinical improvement. Hospital stay 10 days. Clinical diagnosis: traumatic and alcoholic encephalopathy.

Electroencephalographic findings: A series of four electroencephalograms was taken from September 22 to September 30, 1948. The pre-procaine therapy electroencephalogram of September 22 showed a fairly regular 9 per second activity from the bi-occipital and bi-parietal leads and moderate high voltage (60 to 100 microvolts) and 6 to 7 per second activity in the bi-frontal leads. After 30 seconds of hyperventilation, long runs of high voltage (300 microvolts), slow (2 to 3 per second) activity were elicited in the right frontal lead and to a lesser degree in the left frontal lead. This abnormality persisted after the hyperventilation was discontinued. The cerebral activity improved with procaine therapy. The electroencephalogram of September 30, with the same degree of hyperventilation, elicited only short runs of 6 to 7 per second waves (60 to 75 microvolts) in the bi-frontal region, while the rest of the cerebral activity was within normal limits. Thus the cerebral activity improved about 90 per cent in eight days.

There has been no follow-up in this case.

Case 2: B. W., a girl aged 16, with onset of convulsions at 10. Status epilepticus precipitated by emotional shock. Five intravenous injections of procaine hydrochloride during last hospital admission, with more benefit than from the anticonvulsant treatment used previously. Hospital stay 17 days (during which she had an appendectomy). Clinical diagnosis: traumatic and psychogenic encephalopathy.

Electroencephalographic findings: A series of five electroencephalograms was taken from September 7 to October 7, 1948. The pre-procaine therapy electroencephalogram showed moderate high voltage (60 to 100 microvolts), 5 to 6 per second activity. The last electroencephalogram, one month later, showed 7 to 9 per second activity with normal voltage. Thus the cerebral activity improved about 80 per cent.

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There have been no convulsions during the past three months. She fainted once during emotional stress.

Case 3: V. S., a girl aged 15, with convulsions beginning a few days after a febrile illness. Old history of bilateral otitis media in repeated attacks. Three daily injections of procaine hydrochloride. Hospital stay 16 days. Clinical diagnosis: infectious encephalopathy.

Electroencephalographic findings: A series of five electroencephalograms was taken from September 30 to October 7, 1948. The pre-procaine therapy electroencephalogram of September 30 showed from all leads long runs of a high voltage (200 microvolts), slow (2 to 3 per second) activity. Between these bursts small amounts of 6 to 7 per second activity were seen. The activity improved about 50 per cent with procaine therapy.

Since leaving the hospital the patient has had no more convulsions. She has gained weight and has felt better. She is studying with a home teacher.

Another electroencephalogram taken November 23, 1948 showed sustained improvement, now considered 60 per cent.

Case 4: T. B., a Negro girl aged 14. History of poor adjustment at home. Infectious and toxic encephalopathy following a cold treated with penicillin and sulfadiazine. Catatonic excitement. Nine procaine injections with recovery from psychosis. Hospital stay one month.

Electroencephalographic findings: A series of four electroencephalograms was taken from October 19 to November 4, 1948. The pre-procaine therapy electroencephalogram of October 19 showed a high voltage (70 to 100 microvolts) and moderately slow (5 per second) activity in the anterior half of the cerebral cortex. In the occipital leads there was slow activity (2 to 3 per second) waves with amplitude of 250 microvolts. After procaine therapy the activity improved to show 6 to 7 per second activity. Thus the cerebral activity improved about 80 per cent.

A recent report of this patient indicates good physical improvement. She attends school, where her adjustment is good. The school physician reports need for follow-up treatment as the grades are a little less than average.

Another electroencephalogram taken November 23 shows that the degree of improvement previously shown (80 per cent) was maintained.

Case 5: M. J., a female Negro graduate nurse aged 30, with confusional episodes following a shocking experience. Four or five injections of procaine hydrochloride, with improvement. Hospital stay nine days. Clinical diagnosis: psychogenic encephalopathy.

Electroencephalographic findings: Only two electroencephalograms were taken. The pre-procaine therapy electroencephalogram of October 25, 1948, showed 4 to 9 per second activity from all leads. After about 20 seconds of hyperventilation, long runs of high voltage (300 microvolts) with 2½ per second activity were elicited from all leads. This activity was present after hyperventilation was discontinued. The electroencephalogram of November 1, following the procaine therapy, with the same degree of hyperventilation, failed to reproduce the build-up of the first electroencephalogram. Only occasional 7 per second activity appeared in the bi-frontal area. Otherwise the rest of the cerebral rhythm was 8 to 10 per second activity with normal amplitude. This the cerebral dysrhythmia improved about 90 per cent after the procaine therapy.

At a follow-up visit December 14, she reported much less anxiety and no more convulsive or confusional episodes. She said: "I have more poise." She was apparently cheerful and well adjusted.

An electroencephalogram taken December 14 showed that the 90 per cent improvement was maintained.

Case 6: D. C., a man aged 27, who developed stupor and paralysis due to carbon monoxide asphyxia. Over 30 hours of exposure to lighted gas heater in a closed room. Seven injections of procaine, with clinical recovery. Hospital stay ten days. Clinical diagnosis: anoxic encephalopathy.

Electroencephalographic findings: A series of three electroencephalograms was taken from October 28 to November 3, 1948. The pre-procaine therapy electroencephalogram of October 28 showed from all leads continuous high voltage (100 to 300 microvolts), slow (2 to 5 per second) activity. The electroencephalogram of October 29 (post-procaine therapy) showed improvement in the cerebral activity. The electroencephalogram of November 3, after the procaine therapy was discontinued, showed normal voltage (20 to 60 microvolts) and borderline slow (6 to 9 per second) activity. The cerebral activity was improved about 90 per cent.

It has been impossible to get an adequate follow-up in this case, but information from his cousin is that the patient has gone to New Mexico, where he is working (December 28).

Case 7: F. T., a girl aged 16. Illness of one year, with right-sided headaches after fall on ice. Attacks of unconsciousness with shaking and twitching. Very sensitive startle reaction. Three injections of procaine, with clinical improvement following abreaction. Hospital stay 14 days. Clinical diagnosis: traumatic and psychogenic encephalopathy.

Electroencephalographic findings: A series of four electroencephalograms was taken from November 12 to November 22, 1948. The pre-procaine therapy electroencephalogram showed moderate high voltage (75 to 100 microvolts), slow (5 per second) activity from all leads. The electroencephalogram of November 22, after procaine therapy, revealed the electrical activity to be within normal limits. Thus the cerebral activity improved about 100 per cent.

The patient returned to Tennessee, accompanied by her mother, to re-enter the school she was attending before the illness.

DISCUSSION

When we undertook to correlate the clinical course of patients with intravenous procaine with the electroencephalographic findings, we were disappointed to find that little or no change was observed in the electroencephalogram during the actual injection of the procaine. The only change noted is increase of normal frequencies, particularly when a slow injection is given and the tracing is followed for an hour or two. The more impressive changes have developed over a period of hours. This suggests that the procaine has no direct influence on the cerebral rhythm, but rather sets going a sequence of beneficial actions which ultimately lead to clinical improvement and improvement in the cerebral rhythm. One mechanism, offered here for consideration as the significant one, is a combination of depressed autonomic activity which may result from central effects of procaine, while the other is a moderate degree of muscular relaxation brought about by a curare-like effect of the procaine. This would ultimately relieve hyperventilation and favor a neutral state of tone in the cerebral blood vessels.

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Novocain brand of procaine hydrochloride was furnished by Winthrop-Stearns, Inc.

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Editorial

NEUROLOGY — A CRITIQUE

Tradition, although an admirable trait, can and frequently does impede progress. The field of neurology which has always been proud of its great traditions has indeed suffered from this most valued quality. Since early times the nervous system, because of its anatomic isolation from the rest of the body, has been shrouded in mystery and has been considered as reacting differently from the rest of the human organism. The public and the medical profession alike have assumed that brain functions, whether normal or abnormal, were unusually complicated and mysterious processes beyond the adequate understanding of the ordinary individual. As a result, the various diseases of the nervous system have received little attention from the average practicing physician, and the concept has developed that such illnesses cannot be benefited by therapeutic measures.

So thoroughly has this field been ignored that a great majority of laymen have little or no idea of the components of the nervous system, its importance to adequate functioning of the individual or the numerous common illnesses that are due to involvement of the nervous system. The existence of a specialty or specialist dealing exclusively with this phase of medicine is not even very well known. Few realize that without an adequately functioning nervous system, the individual could become a senseless, sightless, motionless creature capable only of a vegetative existence. There is little appreciation of the fact that such common physical complaints as headache, dizziness, pain, weakness, numbness, difficulty in speech, incoordination, etc., are actually involvements of the nervous system.

The medical profession, too, has unconsciously adopted an attitude of indifference toward the nervous system and has failed to consider how important an adequate knowledge of these structures is to the good practice of medicine. In a great many illnesses treated daily by the physician, there occur associated implications of the nervous system which must be taken into consideration in evaluation of the patient from both a prognostic and therapeutic point of view. For example, many systemic infections are accompanied by cerebral or meningeal complications which may influence greatly the ultimate outcome of treatment. Cardiac conditions, such as hypertension and bacterial endocarditis, frequently terminate in a cerebral involvement which may demand primary attention due to severity of the resulting symptoms. Innumerable other illnesses, such as pernicious anemia, syphilis, eclampsia, uremia, injuries, diabetes, hepatic diseases or pneumonia, may be associated with cerebral complications which require prompt consideration by the physician.

There has been prevalent a concept that the nervous system differs from other organs of the body in that its diseases are incurable and that, after a diagnosis has been made in neurology, very little further help can be offered the patient. One must agree that there are many neurologic illnesses for which there is no specific treatment, but does this differ in any way from illnesses occurring in other organ systems? Do we have available specific treatments for such conditions as cirrhosis of the liver, glomerulonephritis, severe cardiac damage, diseases of the collagen system, etc.? The only saving feature of these illnesses is that they are generally concealed in the body cavities and cannot be seen by either doctor or patient, while neurologic illnesses are in evidence constantly, visible as impaired function, and serve as a constant reminder that we still have much to learn.

Many diseases of the nervous system actually can be treated very adequately. Consider for example the newer therapies available in neurosyphilis, meningitis, subacute combined degeneration, myasthenia gravis, the convulsive disorders, Parkinsonism, brain tumors, strokes, peripheral neuritis, heavy metal poisoning, etc. Even the disabling neurological disorders are offered a most optimistic outlook by rehabilitation therapy. A total retraining program will show improvement in about 75 per cent of even the most severely involved patients if these individuals are not allowed to become complete invalids or dependents after the acute phase of the illness has subsided.

As in many traditional situations, only drastic measures are successful in altering the trends of years. The actual break in neurologic tradition was furnished by World War II. Neurology emerged as a dynamic therapeutic specialty, championed by a group of men who knew from their war experiences that the traditional diagnoses lacked a great deal in practicality and usefulness. This trend has continued and, as a result, many new neurologic techniques and therapies have been developed. Additional stimulus has been provided by the expansion of training facilities in the many Veterans Hospitals where neurologic disabilities comprise a large proportion of their hospital beds and require proper treatment from doctors trained in this field. The Veterans Administration is doing a fine job in attempting to obtain proper treatment for these illnesses.

One must realize, however, that there are millions of individuals in the United States suffering from neurologic disturbances. It is impossible to train adequate numbers of specialists to treat all of these cases. It is imperative, therefore, that treatment of most of them be undertaken by practitioners who have been trained properly in medical school by a competent staff of neurologists. It is the responsibility of every medical school to recognize the importance of this branch of medicine and to encourage adequate training, teaching, and research in this field in the interests of better medicine and greater benefit to the public.

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Division of Neurology
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Future Meetings

CONTINUATION COURSES

The University of Minnesota announces a continuation course in dermatology for doctors of medicine who are engaged in general practice. Throughout the course, emphasis will be placed on the diagnosis and management of common skin disorders. A special feature at the close of the course will be a conference on diagnostic problems which will challenge the diagnostic ability of the registered physicians.

This course will be presented at the Center for Continuation Study on March 27, 29, 1950.

A course in pediatrics will be given April 10-12, 1950, at the University of Minnesota Center for Continuation Study, for physicians specializing in pediatrics. The course will be devoted to disorders of metabolism and endocrine function.

Distinguished visiting physicians who will participate as faculty members for the course are Dr. Daniel C. Darrow of Yale University School of Medicine, and Dr. George M. Guest, Children's Hospital, Cincinnati, Ohio.

A continuation course in gynecology for doctors of medicine engaged in private practice will be presented at the Center for Continuation Study on April 17-19, 1950. Among the subjects to be considered are uterine bleeding, inflammation of the cervix uteri, urinary incontinence, and lesions of the vulva.

The University of Minnesota announces the 7th biennial continuation course in otolaryngology to be held June 26, 27, 28, 29, 30, 1950. This course, designed to bring to the practicing otolaryngologist the newer concepts and developments in the specialty, will be under the direction of Dr. Lawrence R. Boies and associates of the University Medical School. Guest lecturers will include Dr. Percy Ireland, Toronto; Dr. LeRoy Schall, Boston; Dr. Philip Meltzler, Boston; and Dr. John Shea, Memphis.

A symposium on hypertension will be presented on the campus of the University of Minnesota on September 18-20, 1950, in honor of Drs. Elexious T. Bell, Benjamin J. Clawson, and George E. Fahr. Doctors Bell and Clawson retired from the Department of Pathology in June 1949 and Dr. Fahr will retire in June 1950 from the Department of Medicine.

The symposium in honor of these men is appropriate since all three have had special interest in this disease. Support for the symposium has been provided by the Variety Club, the Mayo Foundation, and the University of Minnesota. All interested physicians will be welcome to attend.

The University of Minnesota will offer a three-day continuation course in care of the aged in institutional homes, to be held March 13, 14 and 15, 1950, at the Center for Continuation Study. The course is being presented with the cooperation of the Minnesota Department of Health and the State Division of Social Welfare. The purpose of the course is to consider the health, recreational, and social needs of the residents, as well as administrative problems in conducting the homes to meet those needs more adequately.

Opportunities Open

CHEST DISEASE ESSAY AWARD

The Board of Regents of the American College of Chest Physicians announces a cash prize award of $250 to be given annually for the best original contribution, preferably by a young investigator, on any phase relating to chest disease. The prize is open to contestants of foreign countries as well as those residing in the United States. The winning contribution will be selected by a board of impartial judges and the first award will be made at the forthcoming annual meeting of the College to be held in San Francisco, June 22-25, 1950.

The College reserves the right to invite the winner to present his contribution at the annual meeting, and to publish the essay in its official publication *Diseases of the Chest*. Contestants are advised to study the format of *Diseases of the Chest* as to the length, form and arrangement of illustrations to guide them in the preparation of the manuscript. Additional information may be obtained from the Executive Secretary of the College, 500 North Dearborn Street, Chicago 10, Illinois.

GENETICISTS OFFER PRIZE

The American Genetic Association announces a prize of $1,000.00 for the best essay written during 1950 in partial answer to the question: "Who marries whom, and why?" The contest is devoted to "delimiting the boundaries of a non-geographical human mating isolate." It is hoped that the contest will clarify some of the social, economic, and educational factors which are important in determining marriage choices.

Prizes totaling $2,000.00 are offered, the first being $1,000.00. The contest closes February 28, 1951. The competition is open to all qualified students and specialists in this field. For additional information write the American Genetic Association, 1507 M Street, N.W., Washington 5, D. C.

AMERICAN BOARD OF OPHTHALMOLOGY

Candidates for the certificate of the American Board of Ophthalmology are accepted for examination on the evidence of a written qualifying test. Tests are held annually in various parts of the United States.

Applications are now being accepted for the 1951 written test. They will be considered in order of receipt until the quota is filled.

Practical examinations for acceptable candidates are as follows: Boston, May 22-26; Chicago, October 2-6; West Coast, January, 1951.

News Briefs

North Dakota

Research and institutional grants totaling $42,850 to help in the fight against cancer have been made to the University of North Dakota medical school by the State Cancer Society.

Dr. L. W. Larson of Bismarck, chairman of the cancer society's executive committee, said the institutional grant is for $18,450, and the research grant, $24,400. The institutional grant is earmarked for the departments of pathology, physiology and anatomy. It will be used mainly to buy special equipment for cancer research.

The research grant will cover salaries for research fellows, students, and technical personnel, and the cost of expendable equipment and materials such as experimental animals and chemicals.

Licenses to practice in North Dakota have been granted 22 physicians following state board examinations. Successful applicants, listed by place of practice, include Roy F. Messinger, Beach; Joseph McEvoy, Bismarck; Warren L. Macauley, Fargo; Myron J. Talbert and Robert C. Painter, Grand Forks; Cyril M. Guest, Minot; Frank M. Melton, Fargo; James J. Doyle, unknown, and John C. McEwen, Bismarck.

Others are Sidney T. Gettelman, Beulah or Stanley; John S. Gillam, Fargo; Kenneth Wakefield, Gackle; Harry B. Fitzjerrell, Jamestown; Joseph O. Boreski, Gretna; Clifford W. Hogan, Fargo; David C. Jaehning, Fargo; Joseph G. Beaton, Fargo; William A. Tompkins, Grafton; Dewitt D. Shannon, Riverdale; and John McNeil, Hettinger.

A half million dollar building fund campaign for St. Luke's Hospital in Fargo is under way. Campaign officials hope to raise $500,000 for the hospital so that 120 beds may be added to overcrowded St. Luke's.

Medical Society Elections . . .

Dr. Robert Fawcett has been named president of the Devils Lake District Medical Society. Other officers are Dr. L. F. Pine, vice president; Dr. D. W. Fawcett, secretary-treasurer; Dr. D. W. Palmer, censor; Dr. G. W. Toomey, delegate to the American Medical Association; Dr. William Fox, alternate A.M.A. delegate; and Dr. Chris Johnson, program chairman.

* * *

New officers of the Grand Forks District Medical Society were elected at the January meeting. Named president was Dr. R. E. Mahowald; Dr. C. R. Tompkins, Grafton, vice president, and Dr. Lloyd Ralston, secretary-treasurer.

* * *

Dr. Charles A. Arneson of Bismarck has been named president of the Sixth District Medical Society. Dr. Leonard Fredericks is the new vice president, and Dr. Clifford Peters was re-elected secretary-treasurer. Dr. E. G. Vinje of Hazen was named to the board of censors.

Dr. V. J. Fischer of Minot was named president of the Northwest District Medical Society at the January meeting of the group. Dr. R. T. Gammell, Kenmare, was elected vice president and Dr. Wm. C. Hurly of Minot, secretary-treasurer.

* * *

Dr. Earl M. Haugrud of Fargo has been named president of the First District Medical Society. Dr. John H. Bond of Fargo was elected vice president, and Dr. Hugh Hawn of Fargo, secretary-treasurer. Named to the house of delegates were Dr. Haugrud, Dr. A. C. Fortney of Fargo and Dr. C. V. Bateman of Wahpeton. Alternates are Dr. Bond, Dr. J. R. Dillard of Fargo and Dr. E. J. Biethon of Wahpeton.

* * *

Stutsman County Medical Society elections for 1950 include: president, Dr. John W. Jansonius of Jamestown; vice president, Dr. Basil Maloney, LaMoure, and Dr. Richard Nierling, Jamestown, secretary and treasurer. Dr. Thomas Pederson, Jamestown, was elected delegate to the state medical meeting with Dr. J. N. Elsworth, Jamestown, alternate.

New Appointments and Locations . . .

The DePuy-Sorkness Clinic at Jamestown announces the association of Dr. Edwin O. Hieb in the field of internal medicine. Dr. Hieb has just completed his residency in internal medicine at St. Luke's hospital and the Fargo Clinic in Fargo.

* * *

A new doctor has been secured for the Beulah Hospital now under construction. He is Dr. Wesley E. Levi. The new 20-bed hospital will be 44x122 feet with a wing 41x56 feet extending from it. The wing will include the operating, x-ray and delivery rooms. The hospital committee expects to have a second doctor when the new structure is completed.

* * *

Dr. John B. McHugh, new manager of the John Moses Memorial Veterans Hospital in Minot, has arrived to assume his duties. Besides acting as manager, Dr. McHugh also will serve as chief of professional services at the hospital, a post he held at his most recent appointment at the VA hospital in Outwood, Ky. He hopes to have a full-time staff of seven doctors, including the chief surgeon and the chief of medicine.

* * *

Dr. George N. Vigeland of Maddock has joined the staff of the Johnson clinic at Rugby. He is a son of Dr. J. G. Vigeland of Brinsmade and took his medical work at the University of North Dakota and at Northwestern. He served his internship and residency at Ancker hospital in St. Paul, Minn. He has a brother in Rugby who is a dentist, Dr. H. H. Vigeland.

* * *

Dr. John C. McEwen, a native of St. Louis, Mo., has joined the staff of the Missouri Valley Clinic in Bismarck and will specialize in internal medicine.

South Dakota

The Tschetter-Hohm Clinic at Huron, modern throughout in medical and surgical equipment, opened just after the first of the year. The new fully air-conditioned clinic is a T-shaped structure of one floor with a full basement. Just off the lobby is the small reception room so that patients going to the clinic at night may telephone the doctor on duty.

The Tschetter-Hohm Clinic is staffed by Dr. Paul Tschetter, Dr. Paul Hohm and Dr. Ted Hohm. In May 1946 the Doctors Hohm joined Dr. John S. Tschetter and Dr. Paul Ttschetter in the clinic. Dr. John S. Tschetter, now mayor of Huron, retired from active practice in 1949.

Dr. Lyle Hare of Spearfish placed third in the nation's "General Practitioner of the Year" contest held at the December session of the American Medical Association in Washington, D. C.

A graduate of the University of South Dakota and the University of Illinois college of medicine, Dr. Hare has practiced 38 years in an area extending into three states. He has delivered 3,000 babies in Spearfish and surrounding territory. Dr. Hare is a former mayor of Spearfish.

Eight South Dakota communities have been granted emergency status in the field of medical care by the South Dakota State Board of Medical Examiners. Seventeen requests for declaration of emergency status were received which would allow the communities to secure the services of a displaced person physician under the law passed at the last session of the legislature. Approved were Lake Norden, Kennebec, Eagle Butte, Newell, Isabel, Hill City, Sanator and the state hospital at Yankton.

Dr. L. D. Harris, associated with Dr. A. W. Spiry in the Spiry-Harris clinic at Mobridge for the past nine years, has given up his practice of medicine and surgery for further study in the field of ophthalmology at the University of Minnesota and at New York University.

Recent Appointments . . .

New officers at the McKennan Hospital, Sioux Falls, are: Dr. L. J. Pankow, chief of staff; Dr. Anton Hyden, assistant chief, and Sister M. Borgia, secretary.

Committee appointments include: Credentials: Dr. F. C. Kohlmeyer, chairman; Drs. Robert Van Demark and M. O. Lanam; medical records: Dr. Robert Ogborn, chairman; Drs. Robert Donahoe and Howard Shreves; intern training: Dr. John McGreevy, chairman; Drs. W. J. Hage, Robert Quinn and John W. Donahoe.

Library: Dr. T. J. Billion, Sr., chairman; Drs. W. Arneson, H. O. Kittleson, V. V. Volin and C. W. Ihle; public relations: Dr. E. J. McGreevy, chairman; Drs. Arnold Myrabo and D. H. Breit; auditing: Dr. E. L. Rich, chairman, and Dr. N. E. Wessman; diagnostic and clinical aids: Dr. Myrabo, chairman, and Drs. Hage, Breit and Shreves; obstetrical: Dr. William Sercl, chairman, and Drs. F. S. Stahman and Quinn.

Dr. W. A. Delaney, Sr., has been named president of the medical and surgical staff of St. Joseph's hospital, Mitchell. Other officers are Dr. B. R. Skogmo, vice-president, and Dr. Clarence Moran, secretary.

* * *

Dr. Glen Heidepriem, Deadwood, has been appointed superintendent of the Lawrence County Board of Health by Dr. G. J. Van Heuvelen, state health officer. The term expires July 1, 1951.

Medical Society Elections . . .

Dr. Harold P. Adams was elected president of the Huron District Medical Society at the organization's annual business meeting held recently. Other officers elected included Dr. Ted Hohm, vice president, and Dr. Fred Leigh, secretary-treasurer.

* * *

Dr. J. C. Rodine, Aberdeen, has been elected president of the Aberdeen District Medical Society for 1950. Other new officers elected are Dr. Paul Scallin, Redfield, vice president, and Dr. C. L. Vogele, Aberdeen, secretary-treasurer.

* * *

Dr. Mary A. Schmidt is the new president of Watertown District Medical Society. Vice president is Dr. G. Robert Bartron; Dr. Donald N. Fedt is secretary-treasurer.

* * *

The Third District Medical Society has elected officers as follows: president, Dr. Dean C. Austin, Brookings; vice president, Dr. Donald Scheller of Arlington; secretary, Dr. Calvin M. Kerschner of Brookings; delegates, Dr. F. E. Boyd of Flandreau and Dr. E. A. Hofer of Canova; alternates, Dr. Magni Davidson of Brookings and Dr. Clarence Sherwood of Madison; censors, Dr. M. Drobinsky of Estelline, Dr. J. A. Muggley of Madison, and Dr. M. C. Tank of Brookings.

* * *

Dr. M. A. Auld, Yankton, has been elected president of the Yankton District Medical Society. Dr. R. F. Schwarts of Wakonda was elected vice president and Dr. F. J. Abts was retained as secretary-treasurer.

Establishing Practice . . .

Dr. Harlan White at Timber Lake.

* * *

Dr. John Bartness at Bowdle. He will assume duties as physician and surgeon in charge of the Bowdle Hospital.

* * *

Dr. Abner Willen, at Clark. He is associated with the Clark Medical Clinic.

* * *

Dr. Thomas A. Marvin has resumed practice of medicine at Faulkton.

* * *

Dr. Wendell W. White plans to establish a practice at Dupree about the fifteenth of March.

Minnesota

Dr. Donald C. Balfour of Rochester, director emeritus of the Mayo Foundation for Medical Education and Research, received the University of Minnesota's "Builder of the Name" medal on February 16.

Dr. Balfour, world renowned surgeon and director of the Mayo Foundation, a division of the University's graduate school from 1937 to 1947, is the fourth person to receive the award. The honor was established by the Board of Regents in 1947 to be given in recognition of outstanding service to the University. President J. L. Morrill of the University presented the medal to Dr. Balfour during the convocation held in Northrop Memorial Auditorium marking the 99th anniversary of the University's founding by the Minnesota territorial legislature.

Plans for a 10-story diagnostic clinic building to cost an estimated $12,000,000 have been announced by Dr. A. R. Barnes, chairman of the board of governors of the Mayo Clinic. The building will house nearly all the facilities to be used by patients and will be constructed by Mayo Association, holding company for the clinic properties.

The present clinic building, completed in 1929 at a cost of nearly 3 million dollars, will be used for professional and medical graduate education, therapeutics and laboratory facilities.

The new structure will be located in the block west of the present clinic building and will occupy space where the present Mayo Foundation Museum of Hygiene and Medicine now stands. Construction is scheduled to start August 1 and will require three and one-half to four years to complete.

Dr. Albert M. Snell, who went to the Mayo Clinic a quarter century ago from Mankato, resigned from the Mayo staff recently to enter private practice at Palo Alto, Calif. Dr. Snell was on the staff of the Mankato Clinic for about three years before going to Rochester in early 1925.

Dr. Theodore B. Rasmussen, professor of surgery and chief of the division of neurosurgery at the University of Chicago, gave the University of Minnesota J. B. Johnston lecture in neurology on January 31. His subject was "Cortical Localization."

Dr. Rasmussen is the first University of Minnesota medical school graduate to give the Johnston lecture, scheduled annually in honor of the former professor of neurology and dean of the college of science, literature and the arts at the University.

Dr. Ralph Rossen, the state's first commissioner of mental health, was given his official commission by Gov. Luther W. Youngdahl February 2 at a public dinner honoring him. Formerly superintendent of the Hastings state hospital. Dr. Rossen was appointed to the post effective January 1.

A native of Hibbing, Minn., he is a graduate of University of Minnesota Medical School and holder of advanced degrees in psychiatry and neurology.

At St. Peter state hospital in 1936 Dr. Rossen helped the late Charles Frawley initiate the non-restraint rehabilitation treatment now prescribed as standard for Minnesota's seven mental hospitals. He became Hastings superintendent in 1938, returning there after service as a lieutenant commander in the navy in World War II.

As mental health commissioner, Dr. Rossen will stress professional staff training for improved patient care and cure, and scientific research into psychic and physical cause and treatment of mental illness.

Mayo clinic psychiatric staff members will give advanced training to doctors in Minnesota's state hospital system under an extension of the mental health program announced by Governor Youngdahl.

The psychiatric specialization program has been worked out jointly by Dr. Francis J. Braceland, head of the Mayo psychiatric section at Rochester; Dr. Magnus C. Peterson, Rochester state hospital superintendent, and Dr. Ralph Rossen, newly appointed state commissioner of mental health.

Each of Minnesota's seven state hospitals eventually would be a training and research center under the program.

Minneapolis Maternity Hospital has established what its staff physicians believe to be a record in 6,845 consecutive maternity cases without a death among the mothers.

Recent records have been reported from hospitals in the following cities: Halifax, Nova Scotia, 5,390 consecutive cases without the death of a mother; Chicago, Ill., 5,641 cases and Madison, Wis., 5,500.

Maternity hospital's records ran from April 1940 to August 1947. Since May 1948 there have been 2,288 cases without a mother's death.

During the past 13 years there have been only three deaths of mothers in 13,009 cases for a rate of .023 per 1,000. The national average maternal mortality is 1.3 deaths per 1,000.

A new neurologic center was dedicated at Glenwood Hills Hospital recently. The $250,000 neurologic center will be the Upper Midwest's first, other than military and veterans' installations.

It will treat and retrain victims of nervous system diseases such as polio, multiple sclerosis, paralysis, speech disorders and many more. The new unit will include capacity for 40 bed-patients and 40 out-patients. Neurologists and neurosurgeons will serve on the staff, working with occupational, corrective and physical therapists.

Glenwood Hills to date has been solely a psychiatric hospital. The new wing will add a new psychiatric floor, too, to the hospitals' old 80-bed capacity.

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American College Health Association News

Are you anticipating a vacancy on your staff? If you wish to contact personnel seeking positions in college health service, please inform the secretary. Her address is: School of Public Health, University of California, Berkeley 5, California. This service is conducted without expense to the employer or employee.

Requests have been received for information about vacancies from the following:

1. Male physicians
2. Woman physician—has had about ten years in Student Health Service
3. Psychiatric case worker.
4. Nurses.

The following institutions have requested that their membership be discontinued:

Jersey City Medical Center—Jersey City, N. J.

Bennett College—Greensboro, North Carolina.

Valley City State Teachers College—Valley City, North Dakota.

The report of the Third National Conference on Health in Colleges entitled A Health Program for Colleges is an excellent statement of generally accepted standards for a total college health program. The report can be used by an institution to evaluate its program, facilities, and activities. Orders for the book should be sent to L. W. Holden, M.D., University of Colorado, Boulder, Colorado, with a check for $1.25.

Deaths

Dr. William H. Gaugh, 90, retired Granada, Minn., physician, died December 7th. At the time of his retirement in 1939 he was the oldest practicing physician in Minnesota.

Dr. M. J. Hammond, 73, of Watertown, S. D., died December 9. Associated with the Northwestern Clinic for many years, he was chief of staff at Luther hospital in 1938.

Dr. Charles L. Rodgers, 67, died December 15 at Minnesota Soldiers Home, Minneapolis. Dr. Rodgers had been medical officer at the home for several years. He was a native of Farmington, Minn.

Dr. B. F. Bettelheim, resident of Spearfish, S. D., for 36 years, died there December 20.

Dr. George Douglas Head, 79, Minneapolis physician for 53 years, died December 19. He was the first doctor in Minneapolis to specialize in internal medicine.

A native of Elgin, Minn., Dr. Head was a graduate of University of Minnesota Medical School, and was professor of clinical medicine at the university from 1902 to 1909. He had served as president of Hennepin County Medical Association, Minnesota State Medical Association and chief of staff at Abbott Hospital.

Dr. John Charnley McKinley, professor emeritus of neurology and psychiatry at University of Minnesota, died January 3 at the age of 58. Retired in 1945, when he was stricken with a cerebral hemorrhage, Dr. McKinley was an authority in his field.

Dr. McKinley, born in Duluth, received his medical degree at the University of Minnesota in 1919 and a degree of doctor of philosophy in nervous and mental diseases in 1921.

He was named acting head of the department of medicine at the university medical school in 1932, at which time he was professor of neurology and psychiatry. He became head of the department of neurology and psychiatry when it was established in 1943, largely through his efforts.

Dr. Jesse G. Smith, Sioux Falls, S. D., died January 7 after an illness of more than two years. He was 40 years of age.

Dr. Frank W. Spicer, 71, prominent Duluth physician and a specialist in heart and internal diseases, died January 21. He had been in active practice for 38 years and held staff posts at St. Mary's, St. Luke's and Miller Memorial hospitals.

Dr. Clinton Smith, 71, pioneer physician in Devils Lake, N. D., since 1903, died January 22 at Miami, Fla., where he had been spending the winter. His body was returned to Devils Lake for the funeral.

Born in Allandale, Ill., Dr. Smith took his first year of medicine at Louisville, Ky., before transferring to Northwestern University, from which he graduated in 1903. He is a charter member of Phi Beta Phi fraternity. He was one of the five pioneer doctors who were honored at the annual meeting of the Devils Lake chamber of commerce in December.

Dr. John Esser, 66, practicing physician at Perham, Minn., for over forty years, died January 27.

Dr. Esser was mayor of the village for four years, village health officer for 25 years, county health officer for six years, a member of the State Board of Health during 1934 and 1935.

Dr. Fannie Dunn Quain, lifelong resident of Bismarck, N. D., died February 2 after a heart attack. She was 75 years old.

The daughter of a pioneer druggist, she was believed to be the first person born in North Dakota to graduate from a medical school and practice medicine in the state and was among the first women to take up medicine as a profession.

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

Copyright 1950 by Lancet Publications, Inc., Publication Office, 514 Essex Building, 84 So. 10th St., Minneapolis 3, Minn.
Entered as second-class matter at the postoffice at Minneapolis under the act of March 3, 1879.
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*Hueper, W. C.: Medical Clinics of North America, May 1949.

The JOURNAL LANCET

Minneapolis, Minnesota
April, 1950

Vol. LXX, No. 4
New Series

Foreword

It is an honor again to be asked by Dr. J. Arthur Myers to make a few introductory comments for this issue of the JOURNAL-LANCET devoted to the subject of tuberculosis.

My pleasure in accepting this invitation is dampened, however, by noting that the issue publishes the obituary of Dr. H. A. Burns, long a leader in tuberculosis control. Dr. Burns had only recently assumed the superintendency of Minnesota's State Sanatorium when I became an epidemiologist in the Minnesota Health Department twenty years ago. His appointment, I believe, was one of the earliest instances of a physician with epidemiological training and experience being placed in charge of a tuberculosis hospital. Shortly thereafter, another pioneering step was taken by his appointing a full-time epidemiologist to his staff. This appointee happened to be my classmate in the University of Minnesota Medical School, Dr. Floyd M. Feldmann, who is now with me in the National Tuberculosis Association.

One of my earliest public health experiences was working for a brief period with Dr. Feldmann in conducting tuberculin sensitivity surveys in rural schools in northern Minnesota, under the adverse conditions of Minnesota's blizzards, as part of Dr. Burns' program of determining the extent of tuberculous infection in various counties of Minnesota. It is with deep regret, therefore, that I note the occasion for the obituary in this issue.

As to the other articles, I note with satisfaction their broad scope—not only as to subject matter, but geographically speaking, as well. In view of the communicable nature of tuberculosis, it is proper that physicians living in and in the vicinity of Minnesota where such tremendous advances have been made in the control of tuberculosis (although much still remains to be done even in that area), should take an interest in the problem of tuberculosis in other sections and segments of the population in this country, and among peoples of other countries, where comparable advances have not thus far occurred.

JAMES E. PERKINS, *Managing Director,*
National Tuberculosis Association

Herbert Arthur Burns, M.D.

Physician, Epidemiologist, Educator and Benefactor of Humanity

J. Arthur Myers, M.D.
Minneapolis, Minnesota

Probably few physicians have outlined their professional life's work at such an early age and carried through so completely as did Herbert A. Burns. Mr. T. T. Allin (Chicago) a long-time personal friend, states that Dr. Burns decided to study medicine at the age of eighteen with the idea of going into state work where he would have time and money to seek information which might be helpful to other physicians. Dr. Burns received the degree of Doctor of Medicine from the University of Minnesota in 1908. After completing an internship, he was associated with Dr. F. L. Adair in private practice and became clinical instructor in obstetrics at the General Hospital and pathologist at the Swedish Hospital in Minneapolis in 1911. The opportunity to enter state work came in 1912 when he was appointed epidemiologist with the State Board of Health. He was promptly assigned to Rochester as acting health officer. In this capacity in 1912, he emphasized the importance of the whole-time health officer in finding and preventing communicable diseases by pointing out that for the most part just severe cases are seen by local private physicians, whereas mild, concealed ones and carriers are discovered only by a careful search of the population. In fact, during a five-month period, 44 per cent of the cases on his records were reported by practicing physicians and the remaining 56 per cent were found by the health officer. In this report, Dr. Burns pointed out that over 8000 deaths from preventable diseases were occurring in Minnesota each year which showed how dearly the citizens paid for tolerance of lawless sources of contagious diseases in homes. He observed that the one great possibility of the whole-time health officer is the creation of a public sentiment which will not tolerate sources in homes to become spreaders in communities. At that time, diarrheal diseases of babies was prevalent and highly fatal, accounting for 6167 deaths among babies in Minnesota from 1909 to 1913. He said: "The business of being a baby in Minnesota during the summer months is accompanied by a greater hazard than that of being a soldier in time of war."

Dr. Burns lived to enjoy the fruits of his labors. For example, when he made the 1912 report, 2330 deaths (mortality rate 109.0 per 100,000) occurred from tuberculosis, while only 503 (mortality rate 17.1 per 100,000) died in 1948 in Minnesota. There were only 28 cases of typhoid with four deaths in 1948, and not a single case of smallpox was reported in 1948 and 1949. The last death from smallpox occurred in 1941. In 1948, there were only 15 deaths from diphtheria, 14 from whooping cough, 11 from measles and three from scarlet fever. Diarrheal diseases of babies had almost disappeared. By 1948 the State Board of Health had grown to a large and effective organization, with eight fine district health units located in strategic places.

Herbert Arthur Burns, M.D.

In the spring and fall of 1914, working with Dr. C. C. Pratt, health officer of Mankato, Dr. Burns conducted a tuberculosis survey in Blue Earth County. This consisted mainly of visiting families and making contacts where deaths from tuberculosis had occurred or where there were open cases in homes. They brought to light 27 previously unreported cases of tuberculosis. Seventeen of these persons were contagious and some were working as housemaids, seamstresses, as sales girls in candy stores, etc.

During the next few years, Dr. Burns' career carried him into various epidemics such as diphtheria and typhoid fever and included a great deal of work in epidemiology of tuberculosis. He was so persistent and methodical that he nearly always succeeded in locating carriers.

He was granted a leave of absence to serve in the Medical Corps of the United States Army in November, 1917. He entered the Army as first lieutenant and served as sanitary inspector at Camp Lewis, American Lake, Washington, where he issued an elaborate report of his work from January to December, 1918. His training and experience as an epidemiologist placed him in good stead to control contagious diseases among the 72,334 recruits admitted to the camp during the year. He promptly made an epidemiological study of acute, upper respiratory infections and recommended methods of control. It is believed that this was responsible in no small way for Camp Lewis having the lowest death rate as well as the lowest incidence of influenza during the 1918 epidemic of any military installation in the United States. He was separated from military service with the rank of captain in April, 1919.

Tuberculosis among veterans so interested him that he resigned as epidemiologist with the Minnesota Department of Health in 1920 and engaged in field work as supervisor of tuberculosis trainees, first with the United States Public Health Service and later the United States Veterans Bureau. During the period 1920-28, Dr. Burns was also an active member of the Lymanhurst medical staff, and for a few years was on the Parkview Sanatorium staff. He also participated in teaching physical diagnosis in the School of Medicine at the University of Minnesota.

In 1928 he resigned from the Veterans Bureau and accepted the assistant superintendency of the Minnesota State Sanatorium, Ah-gwah-ching, and became superintendent and medical director in 1929. His long years of study and experience qualified him admirably for this position. He did not believe that a sanatorium staff should limit itself to the care of sick patients, but that it should be actively engaged in field work searching for contagious cases of tuberculosis as well as others with less extensive disease which had not become contagious. In this effort to stop the spread of tubercle bacilli in the area which his sanatorium served, he introduced epidemiology and his sanatorium was the first in the state and probably first in the nation to employ a full-time epidemiologist.

A preventorium building had recently been erected on the sanatorium grounds which Dr. Burns promptly converted for the housing of contagious cases of tuberculosis. He could see no value in taking the child with simple, primary tuberculosis from his home, either from the standpoint of the individual's health or the protection of the community.

Believing that every practicing physician should be constantly on the lookout for tuberculosis, he put forth effort to encourage and stimulate interest of physicians in this disease in the 44 counties he served. For example, tuberculin diluted ready for administration was distributed without charge. Physicians in the area could have free consultation with sanatorium staff members whenever they desired. Those who had questionable x-ray films of the chest of members of clientele were encouraged to send them to the state sanatorium for reading. This also applied to mass x-ray surveys throughout his area. He personally read the many thousand films sent to him annually and reported to physicians promptly.

As soon as he became superintendent, Dr. Burns began to convert the state sanatorium from a domiciliary institution to a hospital. He appointed consultants to the staff in nearly all major branches of medicine and surgery so that patients who developed non-tuberculous conditions were promptly diagnosed and treated. He early arranged to have all patients in need of chest surgery transferred to the University of Minnesota Hospitals. As this was a distance of some 200 miles, he improvised an ambulance and often accompanied the patients. It was he who stimulated the organization of a special chest service at the University Hospital where his patients could be admitted for unusual diagnostic problems and surgery. He later arranged for a full-time resident surgeon at the sanatorium who did all of the general and chest surgery in the institution. This was continued for some time, but the isolation of the institution made it difficult to retain a resident surgeon, so he procured the services of Dr. T. J. Kinsella, who still goes to the institution periodically and performs the chest surgery. Other excellent staff members were selected so that for many years patients of the state sanatorium have had fine medical and surgical service.

Dr. Burns recognized at once his responsibility in protecting sanatorium personnel against contagion. He developed an effective contagious disease technique and insisted that it be practiced as rigidly as possible. His sizable pamphlet on this subject was made available to both patients and personnel and was greeted by the excellent cooperation of all concerned. From 1935 to 1939 the sanatorium buildings were almost completely remodeled thus converting the institution into one of the finest physical plants to be found anywhere.

A considerable number of Indians, mostly Chippewas, reside in the area served by the State Sanatorium. Tuberculosis mortality rates among them were several times higher than that among Caucasians of the same area. It was obvious to Dr. Burns that this problem must be solved not only for the Indians themselves, but also for many of their white countrymen with whom they were in contact. He began immediately to administer the tuberculin test, make x-ray inspections of the chests of reactors and recommend isolation and treatment for those with contagious disease. Almost no attention had been paid to tuberculous Indians until 1926 when an old school house was converted into a 24-bed domiciliary institution called a sanatorium. In cooperation with the State Board of Health, Dr. Burns contacted government authorities which resulted (1934) in the erection of a special building for 117 Indians on the state sanatorium grounds. As patients, they were found more cooperative than had been predicted. Contagious cases were removed from the reservation and Indian communities and in due time a decrease in mortality rates was observed. In fact, in 1937 the tuberculosis mortality rate among Indians was 529 per 100,000 population, but only 144 in 1948. Dr. Burns became one of America's best students of tuberculosis among Indians and demonstrated that the Indian does not possess an inherent susceptibility to tuberculosis, that he resists the disease as Caucasians do and that he responds to treatment in like manner. The serious problem that had existed for so long among the Indians is now attributed to social conditions as the result of neglect to extend the tuberculosis control program to them.

In 1919, Dr. Burns prepared a manuscript on "Contagious Disease Control in State Institutions." He was aware of a tuberculosis problem of considerable magnitude in such hospitals. When the opportunity came in 1934, he conducted a tuberculosis survey in Minnesota's nine institutions for the mentally ill. Apparently this was the first time such a survey had been conducted on a state-wide basis in this country. He found that 82 per cent of the inmates and 72 per cent of the personnel reacted to tuberculin. These figures were much higher than among persons in the general population. X-ray inspection of the chests of inmates revealed shadows thought to represent lesions of the reinfected type of pulmonary tuberculosis in 11.2 per cent, while such evidence was present in 4.2 per cent of personnel members. Examinations were completed for tuberculin reactors with shadow casting lesions and sizable numbers of both patients and personnel were found to have contagious tuberculosis. He emphasized that this problem was the most urgent one in any population group of the state.

As superintendent of the State Sanatorium with a large tuberculosis control program under way it was impossible for him to attempt to solve the problem in the institutions for the mentally ill at that time, although he frequently called attention to its seriousness. The opportunity came in 1942, when he was relieved of duties at the State Sanatorium and was appointed chief of a newly created Tuberculosis Control Unit in the Division of State Institutions. Immediately he instituted admission and pre-employment examinations and an annual survey of both patients and personnel. He knew the problem could not be solved as long as persons with contagious disease were in contact with other patients and no protection was afforded personnel.

There was no single state institution to which all tuberculous patients could be transferred and kept under strict isolation. The next best course was to find smaller places in four different hospitals where tuberculosis units could be established and all patients transferred to them. Although this was a long step towards the solution of the problem, it was handicapped by administrative difficulties and no unit was large enough to attract well-trained, full-time experts in diseases of the chest.

Despite his strong desire to press on with the control of tuberculosis in institutions for the mentally ill, his loyalty to the nation was so great that he volunteered for military service in World War II and was accepted with the rank of major in 1944. He was eager to participate in the tuberculosis work in either the Pacific or European theatres of war. This was precluded by his age and he was assigned to tuberculosis work among veterans.

On separation from military service in 1946, he returned to the direction of the Tuberculosis Control Unit of the State Division of Institutions. Until a permanent arrangement could be made at the Veterans Hospital, he also continued there as acting chief of the Tuberculosis Service by special petition of the patients.

Dr. Burns never lost sight of the original goal and he persisted in his efforts to have all tuberculous mentally ill patients segregated in one unit. On the recommendation of Governor Youngdahl, the state legislature of 1949 made provision whereby an adequate building is to be made available at the Anoka State Hospital, less than 20 miles from the University of Minnesota School of Medicine. Here, the patient body should be large enough to attract resident physicians and consultants in all phases of medicine and surgery will be readily available. Thus, through his ingenuity, foresight and understanding the most serious tuberculosis problem in his state was well on its way to solution. In 1939, just before Dr. Burns became chief of the Tuberculosis Control Unit in the Division of Public Institutions, the tuberculosis mortality rate in the hospitals for the mentally ill was 1293 per 100,000, but by 1948 it had been reduced to 714. In the state prison, where many cases of tuberculosis and deaths occurred each year for so long, Dr. Burns' program was also effective. In fact, from 1941 to 1949 there were only seven proved cases and no death in this institution.

He longed to live until the building for the tuberculous mentally ill was completed at the Anoka State Hospital and contagion was removed from all of the other state institutions. When he realized that this would not be possible, he experienced deep satisfaction from the assurance of Governor Luther Youngdahl, Carl J. Jackson, Director of the Division of Public Institutions, and Edmund W. Miller, Superintendent of the Anoka State Hospital, that they would carry out his plans to the letter and thus his goal would be attained. He had a fine library, containing many old and rare volumes, which he gave to the tuberculosis division of the Anoka State Hospital for use of those who were to follow him.

Dr. Burns had always been in excellent health. However, in the course of a routine examination late in 1947, a mass was palpated in the region of his left kidney. This was removed in January 1948 and found to be a hypernephroma. It had caused no symptom and there was considerable hope that it had not yet metastasized. Following convalescence from surgery, he resumed work, and while he manifested the same ambition as formerly, he was physically unable to procure the corresponding energy output. Early in July 1949 he suffered a massive brain hemorrhage and died on the eighth. The hypernephroma was found to have metastatized to several places, none of which had caused symptoms and apparently was not responsible for his death.

Mrs. Burns was a constant source of inspiration and help. Before marriage she was engaged in public health nursing. She enlisted in military service during World War I and spent considerable time in Europe. Her training and professional experience provided her with a great deal of information on tuberculosis and a fine understanding of Dr. Burns' activities in this field.

Throughout his professional life, Dr. Burns exhibited energy and endurance which far surpassed that of most men. He was six feet, two inches tall, usually weighed about 225 pounds, and was physically powerful. His mental capacities seemed unlimited. Undoubtedly he possessed more information concerning all phases of tuberculosis than any other Minnesotan.

He was usually far in advance of his time. Being such a thorough student of tuberculosis, he devoted so much thought to methods of controlling it that he frequently outlined procedures and discussed plans which could not materialize until many years later. Thus persons with shorter vision often criticized and referred to him as a visionary idealist. From the earliest work on streptomycin in tuberculosis at the Mayo Clinic, Dr. Burns visualized the possibilities of this antibiotic. While he was in the Army from 1944 to 1946, working on the tuberculosis service of the Veterans Hospital and before streptomycin was available to the Veterans Administration, he had three patients whose disease was progressing so rapidly that he believed nothing but streptomycin would help them. Therefore, he made arrangement with Dr. H. C. Hinshaw to have these patients transferred to the Mayo Clinic where the drug was on trial. When he was separated from service, the patients at the Veterans Hospital were so fond of him that they petitioned for his return. He was so desirous of helping them that he made considerable sacrifice to serve for several months as acting chief of the tuberculosis service on a part-time basis. He was still so convinced that streptomycin would help many of the veterans that he was greatly vexed that this drug was still not available in sufficient quantity through the Veterans Administration. He wrote long letters to the central office in Washington, pleading for just enough streptomycin for a few of his more seriously ill patients who he thought would soon pass the time when anything would be of avail. He was seriously criticized by those who thought he was overestimating the value of streptomycin.

Dr. Burns had long known that everyone who reacts to tuberculin has tuberculous lesions. He realized that if an efficacious drug were available, it would be most effective when administered as soon as possible after tubercle bacilli invade tissues. Therefore, persons whose sensitivity to tuberculin had recently been established should receive such a drug immediately while the lesions are small and vascular and it might be brought into immediate contact with tubercle bacilli through the blood stream. He outlined a project for periodical testing of nontuberculin reactors among the children in one of the institutions for the mentally ill. Whenever a child was found to have recently become allergic to tuberculin, streptomycin was to be promptly administered. He procured a grant from the United States Public Health Service, but before the project was started, it was found that streptomycin is not a germicide, but has only a suppressive effect on tubercle bacilli. It had also been learned that among persons treated with this drug organisms emerge which are resistant to it. Despite his enthusiasm, these facts convinced Dr. Burns that streptomycin was not the drug for his study. Therefore, he withdrew the project, but planned to make another request for funds should a safe drug be discovered which would destroy tubercle bacilli in human tissues.

He had a large store of knowledge on a wide variety of subjects both in and out of the field of medicine. In addition to his busy professional life, he found time to devote to several hobbies. He took great delight in growing several varieties of flowers and was a frequent exhibitor and prize winner at flower shows. He had collected and was growing nearly every kind of iris obtainable. Over the years he assembled one of the finest collections of early American glass in this country. This was gathered, piece by piece, from various parts of the United States. His interest in philately resulted in a large collection of stamps. He had a valuable accumulation of Indian relics, a collection of old and rare books, a large number of phonograph records of classical music and a complete collection of woodsman's tools.

When he became superintendent, the State Sanatorium had a herd of grade Holstein-Friesian cattle which supplied it with dairy products. He detected a few cases of brucellosis among the patients and traced the disease to the cattle herd. Immediately all animals with this disease were slaughtered. On July 1, 1930, the Sanatorium became the first state institution to introduce pasteurization of milk.

Dr. Burns began to replace the grade cattle with registered purebred Holstein-Friesian animals in 1929. By 1933 the average butterfat production of the 28 cows was 583.5 pounds, which was the highest record in the state for herds of over 20 cows. By means of periodic tests for such diseases as tuberculosis and brucellosis, the herd was kept free from diseases transmissible to people.

He entered into a reforestation project of a sizable part of the Sanatorium's 885 acres, growing some of the pine seedlings himself. From 1936 to 1941 he was responsible for planting an average of 50,000 young pine trees a year. He was deeply interested in art and painted a number of scenes in the beautiful Leech Lake region adjacent to the Sanatorium.

Ornithology was another enjoyable hobby. He was especially interested in migration of birds and banded many species in the vicinity of the State Sanatorium. On Pipe Island in Leech Lake, the common tern has a rookery. Dr. Burns banded several thousand of these birds, and was notified of returns as far away as Argentina. On one occasion Professor W. J. Breckenridge, of the Minnesota Museum of Natural History, accompanied him to Pipe Island and made a motion picture film for his museum collection on bird life in Minnesota.

Dr. Burns rose early each morning and rarely retired until well after midnight. A vacation, as such, was unheard of in his busy life. He was so captivated by his professional activities that his work was recreation. This fact, together with his great diversity of interests, is probably the secret of his long days of activity over so many years without a semblance of fatigue or ill health.

For a long time Dr. Burns held membership in the National Tuberculosis Association and the American Sanatorium Association (American Trudeau Society since 1939). He was a staunch member of the American College of Chest Physicians, having served for many years on the Committee on Chest Diseases in Penal Institutions and Hospitals for the Mentally Ill. He was an exceedingly valuable member of the Committee on Tuberculosis of the Minnesota State Medical Association and a similar committee of the American School Health Association. On the latter committee, he played an important part in arranging for certification of schools with reference to tuberculosis control programs in progress.

He had a retiring manner and almost never indulged in controversy in medical meetings. He never talked about salary or personal financial gain. His conversation always centered around the destruction and prevention of disease and service to humanity.

He was not given to flattery nor did he receive it well. When asked for an opinion he stated it briefly and frankly, regardless of whether it agreed or conflicted with those to whom he spoke. Thus, his associates knew exactly where he stood on every issue. These sterling qualities often gave the wrong impression to casual acquaintances, but they gained for him the highest respect, admiration and confidence of those who knew him well. He was thoroughly honest, truthful and sincere. He intended no harm to anyone. There was nothing worthwhile that he would not do for a friend or any good cause.

He was never guilty of discrediting the work of others or attempting to destroy anyone's reputation for his own personal advancement. At the same time, he would vigorously uphold his convictions. He never sought promotion or fame by questionable methods. He had the courage to enter into any situation, regardless of the amount or strength of the opposition. Not infrequently he took a firm stand for what he believed to be right with the full knowledge that it might even cost him his position.

Thus, Dr. Burns pioneered in several projects which have been adopted as standard procedures in tuberculosis control. He always struck squarely and forcefully at the tubercle bacillus and never tolerated slipshod or short-cut methods, or those based on theory for which there is no satisfactory premise. He never went on tangential excursions, but hewed straight to the line. His entire professional life was in a direct course toward the goal of eradication of tuberculosis. This enabled him to make such outstanding accomplishments of world-wide value in a lifetime of 66 years.

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TUBERCULOSIS IN MENTAL INSTITUTIONS

One of the great sources of tuberculosis infection still remaining in this country may be found among inmates of mental institutions. In 1946 there were 635,769 mental patients in the United States, and 4,247 of them died of tuberculosis. This is a rate of 668.0 per 100,000 in contrast to 36.4 for the general population. Deaths from tuberculosis in mental institutions comprised 8.3 per cent of the total deaths from tuberculosis in the United States during that year.—Robert J. Anderson, M.D., Pub. Health Rep., Jan. 7, 1949.

Mediastinal Tumors

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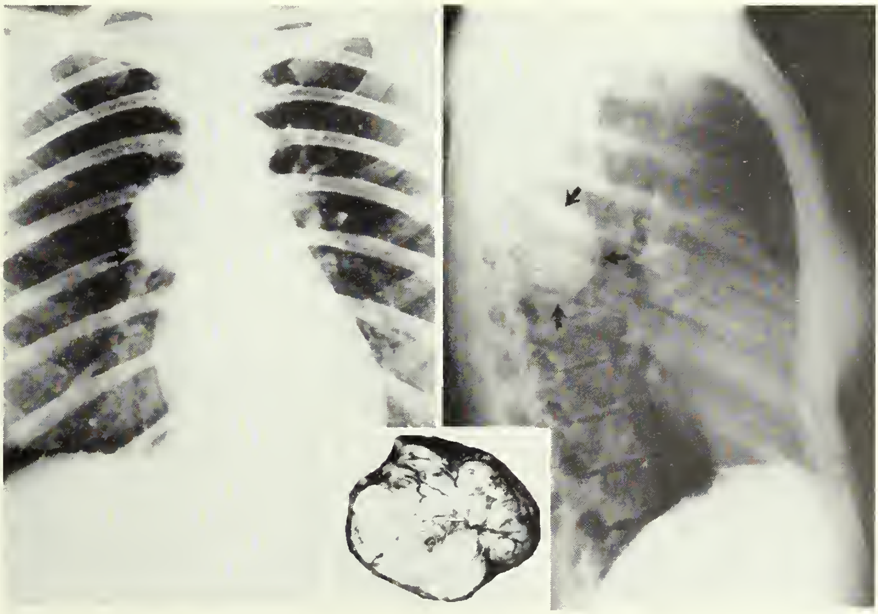
Tumors of the mediastinum are not common lesions but with the increased use of mass x-ray surveys and routine roentgenologic examinations of the chest they are being discovered with increasing frequency. If the malignant mediastinal tumors arising from the lymph nodes, namely the lymphoma group, are excluded then it can be generally stated that the majority of mediastinal tumors are asymptomatic. However, their successful treatment depends upon their detection and excision before clinical signs become manifest. A slow growing tumor should not be managed by a program of watchful waiting. A positive diagnosis is mandatory and this is afforded, with negligible risk, by thoracotomy.

For purposes of orientation, the mediastinum is considered to be the space between the lungs bounded anteriorly by the posterior surface of the sternum and posteriorly by the vertebral column. Inferiorly, it is limited by the diaphragm; superiorly, by the thoracic inlet. Anatomically, the mediastinum is divided into an anterior portion, represented by a frontal plane passing in front of the tracheal bifurcation, the mid-mediastinum encompassing the trachea and its bifurcation, and the posterior portion containing the esophagus, ascending aorta, thoracic duct, vagus, and sympathetic nerves. The anterior mediastinum is, in turn, subdivided at the angle of Louis into the superior and inferior portion, the superior mediastinum containing the thymus and great vessels, the inferior portion the heart and pericardium.

Practically any tumor can occur within the mediastinum. There are certain tumors that occur with greater frequency and in a rather constant anatomical location. The most common are the malignant tumors arising from lymph nodes comprising the lymphoma group (lymphosarcoma, lymphoblastoma, Hodgkin's disease, etc.) and the enlargement of hilar lymph nodes due to inflammatory lesions such as tuberculosis and sarcoidosis. This group of tumors occupies the area where the concentration of lymph nodes is greatest, namely the anterior and mid-mediastinum. Metastatic mediastinal malignancy will occupy a similar location. Exclusive of the group of lymphomas, the most common tumors of the anterior mediastinum are the dermoid cysts and teratomas which have been so conveniently and correctly grouped by Harrington [1] as teratoid tumors. These tumors are thought to arise from the abnormal displacement of cells drawn into the chest by the descent of the heart and may vary from simple dermoid cysts, lined with epidermis and its appendages, to the teratoma containing derivatives of all three germinal layers. Pericardial cysts are the next most common tumors occurring in the anterior mediastinum. In the midmediastinum the bronchiogenic cyst is most frequently seen. Such cysts are lined with ciliated epithelium, contain bronchial elements, and are thought to represent the abnormal development of a supernumerary lung which takes place very early in embryonic life.[2] These were



Figures 1 and 2. (No.37891.) Postero-anterior and lateral roentgenograms of right posterior mediastinal tumor, discovered on routine prenatal chest x-ray examination. Surgical specimen was a benign neurofibroma. Patient alive and well two and one-half years following surgery. Insert shows surgical specimen.

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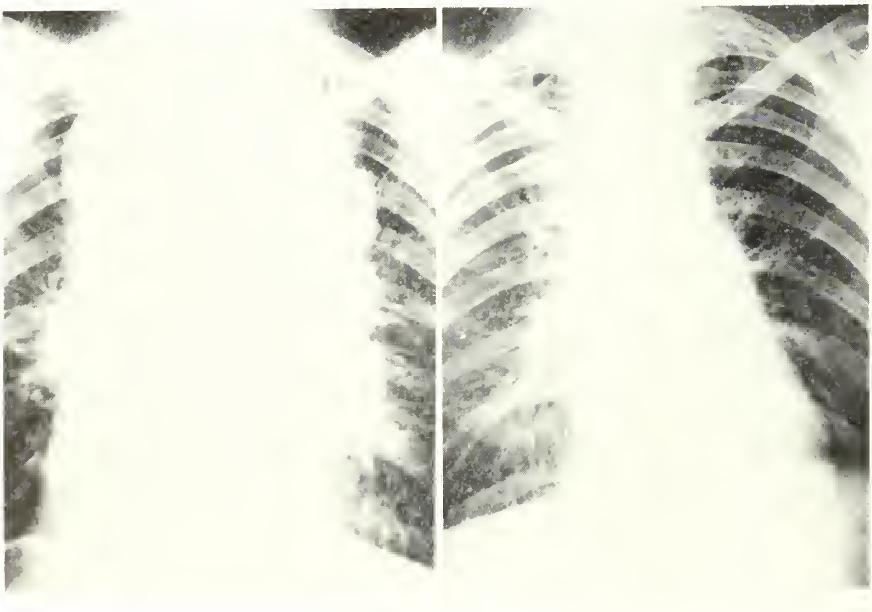
previously considered as being rare tumors but are being reported with increasing frequency. The writer has been able to collect 85 cases in the literature up to January 1, 1950.[3,4,5,6,7,8] The posterior mediastinum harbors the most frequently occurring mediastinal tumors, namely those of neurogenic origin. (Fig. 1 and 2.) In order of frequency these are ganglioneuromas, perineural fibroblastomas, neurofibromas, and neurinomas.[18] This predilection is obvious when one considers the presence of the intercostal nerves and the thoracic sympathetic chain. An occasional rare gastro-enteric cyst will occur in the posterior mediastinum. In the superior mediastinum the majority of tumors arise from the thymus and thyroid. Thymic tumors are usually malignant, several hundred having been reported.[9] Of these, lymphosarcoma predominates, tending to surround the trachea and great vessels. (Fig. 3 and 4.) Carcinoma of the thymus is less common. Tumors of the thymus when associated with myasthenia gravis are most likely to be benign.[10]

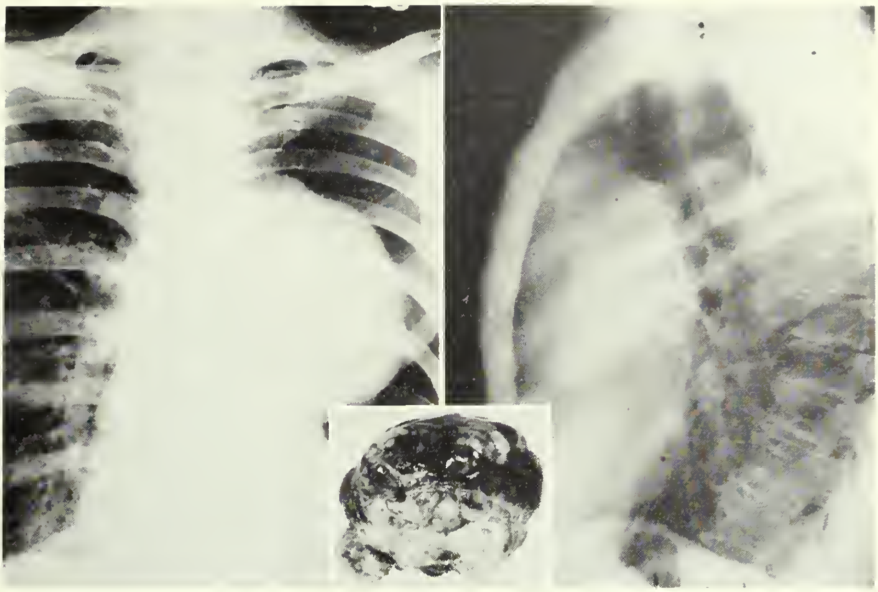
The relative frequency of the various mediastinal tumors, exclusive of the lymphoma group, can be summed up by stating that 75 per cent of the tumors in the anterior mediastinum are of teratoid derivation. Fifty per cent of the tumors in the mid-mediastinum are bronchogenic cysts. Ninety-two per cent of the tumors in the posterior mediastinum are of neurogenic origin. Sixty-five per cent of the superior mediastinal tumors that occupy the anterior half of this space are either thyroid adenomas or thymomas.[11]

In considering the symptoms and diagnosis of mediastinal tumors it is convenient to first consider the common tumor, namely that of the lymphoma group. These tumors represent enlarged hilar lymph nodes and are part of a systemic disease. The finding of an anterior mediastinal mass in a patient with associated weight loss, elevated temperature, and cough in the absence of pulmonary findings of an acute or chronic inflammatory process should make one suspicious of the presence of a lymphoma. Many of these cases show peripheral lymph node involvement and biopsy of the same will substantiate the diagnosis. In a series of 174 cases of Hodgkin's disease reported by Jackson and Parker,[12] 52 per cent showed mediastinal lymph node involvement and in only one was there absence of coincident or antecedent peripheral lymphadenopathy. These tumors frequently show a bilateral, irregular shaped mediastinal mass. When one is reasonably certain that a lymphoma is present differentiation between this and a benign tumor can be facilitated by the response of the tumor to a test dose of radiation therapy. Our x-ray department has used 1000r measured in air, giving 500r through two portals, anterior and posterior. The response to this test dose may be dramatic with complete disappearance of the tumor. (Fig. 4.) One-third of the lymphomas are slow in their reaction to radiation,[13] but if after one month of therapy there is no change in the size of the tumor an exploration should be undertaken to determine the nature of the lesion present rather than continuing with further x-ray therapy which would make ultimate removal of the mediastinal lesion difficult. There are some instances reported in the literature in which a mediastinal lymphoma has been removed surgically; in each instance the operation was undertaken on the assumption that the lesion was not of lymphoblastic origin. Evans and Haight [14] recently reported four such cases. Two of these were Hodgkin's and two were lymphosarcoma. One patient with Hodgkin's disease died seven and three-fourths years later of recurrence. The other patients are alive and apparently free of recurrence at the end of five, four, and two years after surgery. The writer has had this experience in one case which preoperatively was considered to be a teratoid tumor of the mediastinum. (Fig. 5 and 6.)

The preceding comments are not to be construed to advocate surgical extirpation of lymphomas of the mediastinum. This is not the case. On the contrary, they are to be treated by radiation therapy for, regardless of



Figures 3 and 4. (No. 110-905.) Lymphosarcoma of the thymus, roentgenogram (portable) shows marked widening of the superior mediastinum, obstruction of superior vena cava and tracheal compression present. (Figure 4) Same patient as shown in Figure 3 after one month roentgen therapy. Asymptomatic with temporary arrest of lymphosarcoma.



Figures 5 and 6. (No.99460.) Postero-anterior and lateral roentgenogram shows a large unilateral anterior mediastinal tumor in a 70-year-old male whose only symptom was an unproductive cough. No peripheral lymphadenopathy. This was considered preoperatively to be a teratoid tumor. Growth was removed without difficulty at the time of surgery; pathologic report was lymphosarcoma. Insert shows surgical specimen.

the method of treatment, a cure will not be produced. Craver[15] recently stated that it was doubtful if anyone could produce an authenticated case of cure in Hodgkin's disease or lymphosarcoma. It is quite possible that there are other instances of mediastinal lymphomas that have been excised on the assumption that the surgeon was dealing with a benign tumor, such cases not having reached the literature.

The primary tumors of the mediastinum, other than those arising from lymph nodes, are notoriously devoid of clinical manifestations. In 94 of the 109 cases reported by Blades[4] there were no symptoms of intrathoracic disease present. The tumors are usually discovered by routine x-ray inspection of the chest and present a single, sharply outlined, round or ovoid tumor, unilateral in location. Once such a tumor starts to produce symptoms it represents a complication of either infection or malignant change. One of the earliest, most constant symptoms of a mediastinal tumor is the feeling of a vague intrathoracic discomfort. Respiratory symptoms are the next most common; a dry cough usually first noted due to a pressure on a main bronchus or the trachea. As the tumor growth increases in size, wheezing and dyspnea become more marked. This is particularly true with teratoid tumors of the anterior mediastinum. Gastro-intestinal symptoms result when there is pressure on the esophagus with resulting dysphagia. Obstruction of the great vessels, particularly that of the superior vena cava, is frequently observed in malignant tumors. Vascular symptoms are usually absent in benign tumors.

Of the diagnostic aids, roentgen inspection of the chest is by far the most important. A lateral chest x-ray film will show the location of the mass in reference to the anatomical components of the mediastinum.

Fluoroscopy is of particular value in posterior mediastinal tumors, especially where aneurysm is suspected. However, if no visible pulsation is present in the aneurysm, due to the presence of a laminated clot, the differentiation between this and a true tumor may be extremely difficult. In these cases, angiocardiography is of value in outlining the aneurysm,[16] yet seldom does one see an aortic aneurysm in a person in whom all serologic tests for syphilis are negative. The ingestion of barium with careful outlining of the esophagus under the fluoroscope in posterior tumors will show changes of this structure affected by the tumor and will likewise suggest the possibility of esophageal origin if this should prove to be the case. Fluoroscopy is of prime importance in differentiating intrathoracic goiter as this tumor ascends and descends with swallowing. The only other type of tumor, either extrathoracic or intrathoracic, that does this is a benign tumor of the esophagus.[17] Esophagoscopy is indicated only in the posteriorly located tumors where it is thought that the esophagus is involved. Bronchoscopy is of great value when a mediastinal tumor is producing pressure upon the trachea or on one of the major bronchi. It is by this means that the amount of external compression or occlusion can be determined. Likewise, primary bronchogenic carcinoma can be excluded or identified and this common neoplasm may feign a tumor of the mediastinum. Bronchoscopy is not indicated in posterior mediastinal tumors and those located adjacent to the diaphragm. In the differential diagnosis, an abscess of the mediastinum may simulate a tumor. There will always be a primary cause for the abscess, particularly a tuberculous spondylitis with paravertebral abscess formation. Detailed views of the thoracic spine in that area will show confirmatory erosion of the vertebra. Diagnostic pneumothorax as a means of differentiating mediastinal tumors was popular 10 years ago, but it is not indicated at the present time. A more accurate procedure is exploratory thoracotomy.

Complications do occur with mediastinal tumors and these are either infection, which is often observed in the dermoid cysts, or malignant degeneration. There is no test or diagnostic procedure by which one can say that a mediastinal tumor is benign or malignant. These growths can become malignant. As previously stated, the most common posterior mediastinal tumors are of neurogenic origin. These are reported to have a 37 per cent malignancy by Kent,[18] while Heuer [19] reports a 26 per cent malignant change. Of the teratoid tumors 15 per cent are known to show a malignant change.[20] Once malignancy is present the hope of cure is remote and removal may be impossible because of the involvement of associated vital structures.

SUMMARY AND CONCLUSION

In conclusion, attention is drawn to the fact that mediastinal tumors are being found with increasing frequency due to the more extensive use of chest roentgenograms. For this reason the management of the tumor is assuming increasing importance. X-ray therapy in the treatment of these tumors is to be used only when one of the lymphoma group or an inoperable carcinoma can be diagnosed with reasonable assurance. Otherwise, all unilateral mediastinal tumors should be explored. Exploration and resection is relatively simple and the opportunity of cure where a discrete mediastinal tumor can be completely removed is 100 per cent and the risk is negligible.

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CANCER RESEARCH GRANTS AT UNIVERSITY

Among public health service grants to aid laboratory and clinical cancer research in non-federal institutions were three scientists at the University of Minnesota: Dr. I. M. Kolthoff, for biophysical studies of blood serum in normal and cancerous individuals; Dr. Arthur Kirschbaum, for induction of leukemia and other neoplasms in mice and for experimental therapy of leukemia in mice; and Dr. Jerome T. Syverton for immunological studies on mouse mammary cancer and mouse leukemia.

GALLIUM POSSIBILITY IN CANCER RESEARCH

One of the major lead companies produces gallium, a unique metal, in considerable quantity but as yet has learned of no major use for it. A radioactive isotopic form of one of the gallium salts has been injected into test animals and autoradiographs made of the animals' bones. These show that the material has the ability of going direct to the growth areas within the bones and concentrating there. Since gallium, in this form, has a relatively short radioactive life, there are indications that it may prove valuable in diagnosis and possible treatment of cancer of the bone. Work done so far is still in the preliminary stages.

Tuberculosis Control Among American Indians

Horace DeLien, M.D.* and Arthur W. Dahlstrom, M.D.*
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The Bureau of Indian Affairs is unique among Federal agencies in that it is responsible for the total health program of the Indian throughout his life cycle. How well it discharges this responsibility is, however, a moot question. It operates 64 hospitals in the United States and seven in Alaska. Public health and preventive medicine are the most important segments of the health activity. Tuberculosis control is the major health problem since tuberculosis is the leading cause of death.

History of Tuberculosis Among American Indians

No documentary evidence exists of tuberculosis among the natives of North America before the exploration of Alaska by the Russians, Spaniards, English and French. The same is true for the Indians residing in the area now the United States. To date, paleopathology provides little information as to the presence of tuberculosis in Indians in pre-Columbian times. There are, however, unauthenticated reports of spines recovered from ancient excavations that show kyphosis and disease of the vertebrae. Scrofula and consumption are described in the medical literature and elsewhere as occurring commonly among Indians in the 18th, 19th and 20th centuries. Explorers, traders, settlers, clergymen and physicians described the disease and attempted to classify it into major categories paralleling the signs and symptoms attributed to each type. Their cumulative reports shows an increase in morbidity and mortality rates from tuberculosis among Indians. As early as 1654, a statement is made regarding an Indian student who, not long after he took his degree, died of consumption at Charlestown, Massachusetts, where he was placed under the care of a physician and where he "wanted not for the best means the country could afford, both of food and physik."[1] Hemoptysis, cough, dyspnea and expectoration are described increasingly in the health records of Alaska natives including Aleuts, Eskimos and Indians. This disease neither described nor noted previous to the discovery of America was referred to by the Indians subsequently as the "drying sickness" or "coughing sickness." Treatment of the disease in the Indians consisted of a combination of the medicine man's and the non-Indian physician's remedies with equivocal results.

Incidence of Tuberculosis

The Bureau of Indian Affairs statistics in 1925 showed the death rate from tuberculosis to be seven times that of the general population in the death registration area and in the State of Arizona the rate among Indians was 17 times greater than the rate for the country as a whole.

Fellows[2] reported for Alaska a mortality rate from 1926 through 1930 inclusive of 655 and 56 per 100,000 for the native and non-native populations. He also listed tuberculosis as a cause of death in 35.5 per cent of the natives and 4.7 per cent of the non-natives.

Brewer[3] reported 72 per cent of all deaths were due to tuberculosis in the 11 tribes surveyed by him in the southwest. Rates in excess of 2,500 per 100,000 have been reported among the Sioux Indians in the Dakotas. It is evident that prior to the use of x-ray and laboratory diagnostic refinements, the reports of the tuberculosis morbidity and mortality rates among the Indians must be accepted with caution because of the lack of proper diagnostic equipment and diverse collecting and reporting of these data by teachers, traders, clergymen and other non-medical people.

Using x-rays, better statistical evidence was obtained by the Public Health Service in 1912 when a survey of 40,000 Indians residing in 26 states showed that the incidence of shadows thought to represent tuberculosis varied from 1.5 per cent to 21 per cent. The tuberculosis mortality rates for the years 1939 through 1946 are consistently 200 per 100,000 or higher. This consistent high rate of deaths from tuberculosis indicates that the control measures are not adequate. There are a number of factors which are responsible for the lack of further reduction which will be discussed later.

Between 1927 and 1932, 17,000 Indians were examined on 24 reservations and 10 per cent were found to have tuberculosis. In the middle '30s, surveys on the Pine Ridge Reservation in South Dakota in which 6,325 Indians were x-rayed out of a population of roughly 8,000, showed that 6.1 per cent had x-ray findings suggestive of active tuberculosis. Six hundred seventy-six of the 1,000 Arapahoes on the Wind River Reservation in Wyoming were found upon x-ray inspection to have 3.7 per cent with such x-ray findings. Five hundred forty-two of the 1,000 Shoshones in the same area had 4.8 per cent x-ray pictures which suggested tuberculosis. Out of 1,320 of the 8,000 population residing on the Rosebud Reservation 3.6 per cent had such x-ray pictures. On the Papago Reservation in Arizona, of the 482 x-rayed, 6.2 per cent showed such shadows and on the Turtle Mountain Reservation in North Dakota, it was 10 per cent among 1,054 x-rayed of the approximately 7,000 residents. In Alaska, out of the 3,614 examined among the 5,000 natives in the southeastern section, 6.5 per cent had x-ray pictures suggesting tuberculosis. All of these percentages include both the primary and reinfection types of tuberculosis.

The tuberculin test has been used periodically to determine the degree of tuberculinization in Indian communities as well as for its educational and diagnostic value. Some 8,420 individuals among the Pima Indians of Arizona, the Shoshone and Arapaho Indians of Wyoming, the Sioux of South Dakota, the Thlingit, Haida and Tsimpsian Indians in southeastern Alaska and the Chippewa Indians of North Dakota, living under dissimilar conditions and of varying degrees of acculturation, were tested with 0.00002 mgs. and 0.005 mgs. freshly prepared purified protein derivative. This showed that the incidence of tuberculous infection for each five-year period is approximately the same for the different tribes and reaches roughly 100 per cent at the age of 25 years. This indicates that the incidence of tuberculin reactors is not particularly affected by climate, diet, social and economic conditions, tribal stock, or degree of blood admixture.

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TUBERCULIN CONTROL PROGRAM

The tuberculosis control program of the Bureau of Indian Affairs is neither dramatic, exotic nor otherwise unusual so far as its techniques are concerned. It does, however, have certain characteristics determined by the low socio-economic status of the Indians, the varied cultures, the ethnic differences, nomadic life of some tribes and such language barriers as exist. These characteristics require health personnel to be better trained and more experienced in order to carry on the tuberculosis control program. In certain areas, each public health nurse must have a driver-interpreter to explain to the Indians the meaning of the x-ray in relation to tuberculosis and the cause of the disease. The difficulty encountered in covering completely a population scattered from the deserts of the southwest to the colder regions bordering Canada and living in sparsely settled rural communities results in the examination of a smaller number of individuals when compared with similar surveys conducted in urban centers. To illustrate, only 19,334 Indians could be examined with the x-ray between June 30, 1947, and July 1, 1948. However, 3.4 per cent were found to have shadows thought to represent significant tuberculosis. Surveys at Pine Ridge, South Dakota, Rosebud, South Dakota, Papago, Arizona, and among the Navajo Indians showed 3.5 per cent, 2.1 per cent, 2.2 per cent and 4.1 per cent respectively had such shadows.

CONTROL TECHNIQUES

The first technique in our control program is case finding by microfilm x-ray. The photofluorographic units are used in areas where the states are unable to provide such services. Certain of the states, notably Wisconsin, Minnesota, Montana, Oklahoma and Washington and the Territory of Alaska with large Indian populations have taken an active interest in tuberculosis control and have included the Indians in their mass x-ray surveys.

The second technique is to obtain routine x-rays of the chests of all hospital and clinic admissions.

The third method of control is to x-ray all employees of the Health Division upon their entrance on duty in the Indian Service and annually thereafter. Since over 50 per cent of the employees of this division are Indians, the procedure offers an excellent opportunity to study a group who live under better economic conditions than most Indians and are probably exposed to tuberculosis to the same degree as is the general Indian population.

The fourth method is the hospitalization of the known cases of tuberculosis discovered in such surveys either in facilities operated by the Indian Service or through contracts with non-Federal agencies. There are 300 beds under contract and 929 operated by the Bureau of Indian Affairs at the present time.

The fifth method is to follow as carefully as possible all cases discharged from hospitals or sanatoriums, and especially the development of close cooperative action between the various state offices of vocational rehabilitation and the Indian agencies so that after arrestation of the disease in a sanatorium the individual Indian is given the benefit of the experience and facilities of OVR to the end that proper vocational choice is enhanced and the danger of relapse is minimized.

The sixth procedure is the administration of BCG to all the children in Indian Service boarding schools and adjacent mission schools. This is an extension of a program which was begun in 1935 by the Health Division of the Bureau of Indian Affairs as a cooperative study with the Henry Phipps Institute of the University of Pennsylvania in Philadelphia. This investigation was also aided by the National Tuberculosis Association and the National Institute of Health of the United States Public Health Service. In this earlier program, 1,500 Indian children were given BCG under the direction of Dr. Joseph D. Aronson of the Henry Phipps Institute. These children and a comparable group of controls selected at the same time (1936-1938) were observed for the development of tuberculosis for more than 10 years by use of the tuberculin test, by x-ray, and other accepted methods. A substantially higher rate of tuberculosis among the control group indicated the probable value of BCG as an aid in controlling tuberculosis among American Indians.

In the fall of 1948, a selected group of children in the Point Barrow and Wainwright areas in Alaska and among the Navajos of Arizona and New Mexico were given BCG.

The 1949 program was the first major extension of the use of BCG among Indian children. The children in federal and cooperating mission and public schools in Arizona, New Mexico, Colorado, Utah, Nevada, Idaho, Montana, North Dakota, South Dakota, Wyoming, Oregon, Washington, California, Oklahoma, Kansas, Nebraska, Iowa and Mississippi who were negative to the tuberculin test and showed no evidence of other disease were given BCG during the spring and fall months. Approximately 35,000 children were examined and over 13,000 received BCG during the past year.

Dr. A. W. Dahlstrom, Tuberculosis Control Officer of the Bureau of Indian Affairs, was in charge of the field organizational work and Dr. Albert P. Knight of the United States Public Health Service had charge of the technical supervision of the program. Under their direction, field teams each composed of a physician, public health nurse and a recording clerk were trained in tuberculin testing and BCG administration and technical procedures which were developed specifically for the program. Eight such teams were recruited for the spring program and nine for the fall program. From time to time an analysis will be made to determine the results in terms of morbidity and mortality of the groups included. The BCG was provided by the Henry Phipps Institute and was flown to nearby airports located throughout the Indian area. Insufficiency of funds and qualified personnel made it impossible to extend this service to all Indian children during the first year of the program. Schools visited included only those in which the partial or total enrollment was made up of Indians. This program received wholehearted support from the Indians. The tribal councils gave formal consent by resolutions requesting these teams to visit reservations and administer BCG to those children who are non-reactors to tuberculin. The Councils also assumed the responsibility for seeing that all children enrolled in schools were present on the dates BCG administrations were scheduled. It is planned later to extend the service to the children of pre-school age. The conduct of the vaccination program was exceedingly difficult, involving detailed and tight schedules, often operating under adverse weather conditions and over roads sometimes less than trails.

The seventh method is the integration of Indian Bureau control activities with other Governmental and non-Governmental agencies wherever possible. The Indian Service personnel are requested to meet with personnel of other agencies as frequently as possible, to attend meetings where tuberculosis control activities are discussed and to have a thorough understanding of health laws, regulations and ordinances as they affect the individual whether on or off the reservation.

The eighth method of tuebrculosis control depends upon the application of the state, county and city health laws and regulations to each reservation so that uniformity of methods may be used in providing adequate control of communicable diseases. This is possible under the provisions of paragraph 8.78 of the Code of Federal Regulations, Title 25, Indians. The Indian tribes are more and more requesting the application of the State health laws to the reservation areas. In certain instances where the state laws have been invoked, the Indians have considered the laws governing the control of tuberculosis inadequate and have passed exceedingly astute and well chosen ordinances protecting the community against refractory individuals.

The ninth and most important technique used by the Bureau of Indian Affairs, because of the characteristics peculiar to the tuberculosis control program, is that of health education. Every possible method is followed in an endeavor to find a way into the health consciousness of the Indian communities. This consciousness had been undeveloped too long and inconsistently stimulated. The personnel of the Health Division discuss tuberculosis with the hospital in-patients, the school officials, students, the Tribal Councils and any other groups who are interested in the control of tuberculosis. In most of the agencies, the local hospital, together with its health personnel, is the center of all health activities including the control of tuberculosis. It is recognized by the Bureau of Indian Affairs that the Indian people themselves must accept responsibility for control of tuberculosis with the assistance and the technical guidance which is made available through the many divisions at the reservation level, primarily the health activity. Many of the Indian tribes have organized, within the framework of the Tribal Council health councils which are primarily charged with improving the health of the Indians and the sanitation of the community. They meet with the health personnel to discuss health activities, recent advances in the control of disease and report back to their constituents the results of the meetings which they have attended. In one instance, the tribe organized a board of health and in some cases tribal health councils have published mimeographed news sheets dealing entirely with health matters. The Tribal Councils of all Indian tribes have wholeheartedly cooperated in health matters and in the improving of the knowledge of good health practices among their members.

Future Possibilities in Control

The techniques described above indicate, with the exception of certain characteristics mentioned, nothing unusual in the pattern of tuberculosis control used by the Bureau of Indian Affairs. Why do morbidity and mortality rates remain consistently high year after year among the Indians? Primarily, it is the lack of funds and sufficient qualified personnel to operate a health activity at the level of a well organized and functioning county health department. That the lack of funds and personnel preclude continuity in the attack on tuberculosis is well demonstrated by the following cited instances.

The year prior to World War II with an inadequate field health program, 3,000 cases of tuberculosis were discovered and on two reservations every known case was hospitalized. The following year, 50 per cent of the medical officers left the Indian Service and the public health program collapsed, and only 500 cases of tuberculosis were discovered.

In the second instance, the funds appropriated for health purposes among Indians were so sharply limited that admissions to hospitals and sanatoriums had to be restricted. This is best exemplified at Ah-gwah-ching, an 118-bed addition to the Minnesota State Sanatorium, built with federal funds. This year with a large backlog of cases of tuberculosis discovered by the State Department of Health mass x-ray surveys, it was only possible to keep an average of 63 beds occupied. This meant that 55 beds were unused and 200 or more individuals with significant tuberculosis were left in the community to spread the disease. Similarly, Indian Service sanatoriums were operated at 68 per cent capacity because of lack of funds. In addition, there is a net deficit in beds needed to treat tuberculous Indians in the continental United States of 2,000.

In Alaska by 1952, the Bureau of Indian Affairs will operate or have under contract between 900 and 1,000 beds for treatment of tuberculous natives. As of January 31, 1949, with 70 per cent of the population surveyed, 3,089 cases of tuberculosis, all forms, have been found. Of this total, 720 were non-natives. The Territorial Health Department cooperating with the Alaska Native Service have been doing the case finding with photo-fluorographic and portable equipment. If operating funds and personnel are adequate, it will be possible to demonstrate a significant reduction in tuberculosis in this area by 1960. If there is a lack of funds and personnel, the morbidity and mortality rates will continue an exceedingly slow decline or level off on a plateau similar to the pattern existing in the United States.

In conclusion, tuberculosis control among Indians is possible using the time tested public health and sanatorium procedures (an experimental study on BCG has also been introduced) provided operating funds and personnel are available to establish, first, continuity of program at the level of a well organized and operated rural county health department; and second, adequate sanatorium beds for cases found and requiring treatment.

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American College Health Association News

The application for membership of North Carolina College, Durham, North Carolina, has been approved by the Executive Committee. Dr. LeRoy Swift, Director of the Division of Health Education, received the M.D. degree from Howard University and the M.P.H. degree from Michigan University. North Carolina College has a staff of one full-time and three part-time physicians and three full-time and two part-time nurses. There are approximately 775 men and 675 women enrolled in the institution. The final acceptance for membership in the Association will be by approval of the membership at the next annual meeting.

Dr. Rhett G. McMahon has recently been appointed to the position of Director, Student Health Services of Louisiana State University. Other members of the Student Health Service are Dr. T. C. Paulson, Chief of Medical Services, and Mr. J. Y. Bowen, Executive Director.

Herbert A. Ratner, M.D., Director of Student Health and Associate Professor of Public Health at Loyola University School of Medicine, Chicago, is the new Health Commissioner of Oak Park, Illinois.

Dr. H. M. Hardwicke is now Director of the Division of Health Education at Stephens College, Columbia, Missouri.

Dr. Orville T. Rogers, Director University Department of Health, reports that he will need a physician for student health work beginning in September, 1950. The position includes working in the medical clinic and caring for bed patients at the Yale infirmary.

Dr. William E. Taylor, Vice President, South Central Section of the American College Health Association, states that the next annual meeting of the South Central Section of the American College Health Association is to be held Saturday, April 29. They have in the three states approximately 120 colleges and universities. At the meeting held last year there were delegates from twenty-one different schools. Sixteen colleges are members of the national Association.

The Tuberculosis Problem in India

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Over 8,000 years have passed since the medical geniuses of long ago put down their observations concerning the behavior of tuberculosis in human beings in such writings as the Rig-Veda (6,000 B.C.) and described its clinical picture, progress, treatment, and prognosis in words characteristic of Old Indian style, brief and precise. A survey of this literature shows that we are just leaving the boundaries which they reached only in so far as the treatment of the disease is concerned. In the spheres of diagnosis and prognosis there is little that we can claim as our own achievement. Pulmonary tuberculosis was classed as "Kapha-Kshaya" (or phlegm-producing wasting disease). Its symptomatology is aptly described, showing that apparently they knew the disease almost as well as we do.

Treatment consisted chiefly of special and elaborately processed preparations of calcium from mica, coral, pearls and so on; a variety of gold preparation; concentrated vitamins and iron in the form of "Chyavan Prash"*; and a diet enriched with milk, ghee and various vegetables carefully balanced. From the point of view of prognosis, too, the classification of cases was simple and scientific. Three classes were described: (1) Sädhya, or amenable; (2) Dussädhya, or amenable with great difficulty; and (3) A-sädhya, or hopeless. The greatest stress was laid on the preventive measures which were strictly enforced in day-by-day living through hygienic social customs guided by the medical man.

Rich though the literature is in various medical records thousands of years old, we find a period of inactivity—a dark age—which not only halted progress but created an aversion for this literature in the average mind. Because of this aversion, and because it puts restriction on everyday life unwelcome to present day thought, this literature is not studied today. For this reason India has been inactive and has looked to other countries for progress instead of adding her own small mite to the common pool of information. The result is seen in the rough statistics collected four years ago from parts of India and Pakistan which show an annual mortality from pulmonary tuberculosis alone of over 500,000.

The India of socialized asepsis and antisepsis, maintained by means of four castes and their hygienic living, has slowly given place to professional revolutionaries who cry down everything that is old. The only ray of hope is the effort made in countries like America to eradicate this disease from the earth, and the responsibility undertaken by the World Health Organization, which has stimulated the new Indian government to pay greater attention to the disastrous effects of ignoring the disease.

The problem of fighting tuberculosis in India is to a great extent different from that in the rest of the world because of the knowledge of the disease and its consequences to the average man, severe social restrictions in the past on the sufferers and their families, and the natural tendency to avoid restrictions rather than to admit existence of the disease. Poverty and superstition are another handicap, and inborn philosophical tendencies, even in the lowest classes, are a big obstruction to re-education and health teaching. Thus the people have a tendency to hide the disease till the end. Even when it is obvious they take the help of lay doctors to announce to the world that the person is suffering from malaria, flu, bronchitis, or some such illness which is not considered a social evil.

Among the Moslems and the North Indian people again there is the evil custom of "Parda" which has shut off 50 per cent of the population from sunlight and fresh air for generations with the result that we find diseases like osteomalacia and tuberculosis reported among them in the worst forms, and extremely widespread. The Moslems as a community also practice two methods of fraternal expression which are very bad. One is the use of the Hukka, a pipe that is passed from mouth to mouth without any restriction, and the other, the custom of eating from a common dish simultaneously as an expression of love and friendship.

While India satisfied herself by saying that tuberculosis is an incurable disease and putting a social ban on the families of the sufferers, there came from the far-off United States bands of missionaries who fought perseveredly against this and other such diseases by earning the sympathies of these downtrodden unfortunates. There sprang up in different corners of India various Christian societies that carried on incessant propaganda and fight against this evil and against other social odds. Today the sanatoriums established by them are responsible to a great extent in educating the public in the value of revealing the presence of tuberculosis at the earliest possible time and convincing the sufferer and his family that they need not be thrown out of society. Not only that, but they have inspired and trained local doctors and philanthropists who are now responsible for many more sanatoriums that have been catering to the public needs for the past 10 to 15 years.

The problem is still too vast and the only solace is that both public and government have begun to understand it in its proper perspective. It is sufficient to say that in 1950, with over 500,000 deaths per year and an unknown quantity of active sufferers which have been increasing at the colossal rate of 2,500,000 a year, we have only about 120 tuberculosis clinics, little over 6,000 beds and as few as 200 specialists in tuberculosis. On the basis of experience in other countries we should have at least 4,400 clinics, 500,000 beds in hospitals and sanatoriums, and about 13,000 doctors.

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*Complex Ayurvedic tonic named after its originator "Chyavan". Ayurveda—knowledge of life, the name for medical science in all its aspects.

A large scale attack on India's No. 2 enemy is now inevitable, but it will take time. We are just passing from the stage of planning to the stage of action. The Bhore Committee report has suggested extensive measures to which the government has agreed. The All India Tuberculosis Association with its provincial branches has become more active in recent years and the government has also begun to take more and more interest in its activities. At the same time the Health Ministers have begun to talk with particular references to this disease. Already provincial governments have started adding to various district civil hospitals special tuberculosis wards and clinics which, though not yet up to the mark, are to be looked upon as nuclei which will grow into efficient centers for the anti-tuberculosis campaigns when trained doctors and health visitors are available to man them.

It is just an encouraging sign that at these and other 200 centers and sanatoriums an attendance of over 150,000 has been recently recorded—a figure too low in comparison with the morbidity figures. It is hoped that the tendency to conceal this disease will disappear if persistent efforts are continued. What is necessary, and what is prominent by its absence, is the proper type of propaganda among the masses. No one so far has laid adequate stress on this aspect of the problem. The work done by the All India Tuberculosis Association claims figures which are always astounding in a vast subcontinent like this and still inadequate from the point of view of actual results.

The government today is unable to spare more than one per cent of its revenue for the Health Department, a fraction of which is then allotted to anti-tuberculosis work in various forms. From the point of view of the tuberculosis worker, even if India has isolated itself like Russia from the rest of the world for a period, devoting itself entirely to its own reconstruction in health and food problems, the picture would have been brighter today. On the other hand there is now new hope that the tendencies to "one-world" government, free exchange of knowledge, and philanthropic aid to backward countries may speed up the eradication of the disease from all parts of the world.

In the meantime India has to depend on the efforts of private enterprise as it has done for so many years. India has finances if they can be saved from wastage in ignorant hands. Even if all the existing sanatoriums unite into a composite antituberculosis body and coordinate their efforts in groups and on an all-India basis, a useful organization will be built up able to carry on the right type of propaganda based on its collective experience. This propaganda will go straight to the heart of this complex society and achieve results much more rapidly than any other type of organization can do.

There is also great hope that if help is evoked from well-meaning foreign associations like the Minnesota Public Health Association and the National Tuberculosis Association of America, we can learn a good useful lot of modern antituberculosis methods from the successful campaigns that these organizations have carried out.

An exchange of experts and trainees between India and the United States is another method by which the process of de-tuberculization can be laid on more definite and scientific grounds. If an organization like the one suggested above should form, it will not be difficult to carry out such a scheme. These willing volunteers or paid workers will give a good start to the whole machinery either as planned by the Bhore Committee or based on the more practical experience from their own country modified to suit the local conditions.

With this aim in view, and also with the aim of increasing mutual contacts between the two countries I have started during my stay in America, the India America Society, thanks to willing assistance rendered to me by my good friend Dr. J. Arthur Myers and others, I am sure that it will blossom into an important link between the two great countries in the very near future.

All the varieties of tuberculosis that exist in America also exist in India and so we here can take full advantage of the advanced methods of control carried out in that country with equal benefit. My recent visit to the States has given me an opportunity to study the latest developments in surgery as practiced there. I mean to introduce these methods in my institute as soon as the equipment arrives and hope that before long they will spread to all parts of India, thus giving new hope of better life to a large proportion of the tuberculous population, which is today condemned to miserable death.

Subscribers in general and libraries in particular are urged to protect and file carefully each issue of The Journal-Lancet. With increasingly important professional papers being published there is a constant demand for back issues to replace those mutilated, borrowed, mislaid or lost. It is growing harder and in some cases impossible to supply such units which is the reason for this respectful warning.

A Modern Program of Rehabilitation for the Tuberculous

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The eventual control of tuberculosis is dependent upon prevention through early diagnosis, adequate treatment and successful rehabilitation. Each has its proper place in the over-all program but must be carefully integrated to obtain permanent, satisfactory results. Rehabilitation may be defined as the restoration of the tuberculous to the fullest physical, mental, social, vocational and economic usefulness of which they are capable. Rehabilitation is important from the strictly medical standpoint because it apparently aids in maintaining or prolonging the initial physical recovery and thus reduces the relapse rate; it is valuable economically because self-supporting wage earners are created to replace recipients of direct relief; it is most necessary from the humanitarian aspect because self-respect is restored, self-confidence is instilled and the joy of living is renewed.

An organized program of rehabilitation was instituted in 1929 at Glen Lake Sanatorium with the cooperation of the State Department of Vocational Rehabilitation and the Hennepin County Tuberculosis Association. The original program has been modified over the years as experience and changing requirements have indicated. The primary purpose is to assist the individual patient in utilizing his physical, social and economic capacities to the fullest extent.

Training for post-sanatorium life should be started as soon as feasible after admission to the hospital. It generally requires about six weeks before sufficient data regarding the patient's physical condition, educational and work background have been accumulated.

As soon as adequate information is available the case is referred to a committee composed of the directors of social service, education and occupational therapy, the librarians, the physician in charge of the case and the rehabilitation counselor. The physician gives the diagnosis and prognosis, the probable length of stay in the hospital, the type and amount of activity to be permitted and an estimate of the eventual working capacity. The social service worker reports on the social picture of the patient and the family and discusses previous education and employment. The librarian and occupational therapist present any knowledge they may have acquired. The rehabilitation counselor describes the patient's former occupation so that the physician can give an opinion as to the advisability of the patient returning to his previous employment. General recommendations are then made as to the type of program to be followed. The primary survey may indicate that rehabilitation is contraindicated because of (1) serious illness and poor prognosis, (2) severe non-tuberculous handicap or disability and (3) absence of need for rehabilitation. These patients are eliminated from immediate consideration although the initial decisions are subject to periodic review.

The rehabilitation counselor directs and integrates the efforts of the other departments that emphasize bedside or ambulatory teaching and training. She may supplement the available data with aptitude, interest and intelligence tests and conducts interviews with patients so that their desires and needs are given careful consideration. Patients are encouraged to feel that they have definite goals and sincere efforts are made to keep them mentally alert while at the same time complete or partial physical rest may be necessary. The counselor also coordinates the training of the in-patient with continued rehabilitation as an out-patient. We consider this continuity of activities under unified direction as one of the strong points of our program. The counselor may arrange further post-sanatorium educational training, whether it be commercial or vocational experience or academic studies. In other cases, she may aid the patient in obtaining suitable work in industry.

Education is emphasized as long as the patient is kept entirely at rest although even at this stage certain types of occupational therapy may be permitted. Continuation of academic work may be prescribed for the youthful student and this may be carried out at the bedside or in the classroom, depending upon the patient's physical condition. The worker may need to start preparation for a new vocation or undertake review or more advanced studies to improve his ability in his former occupation. The housewife may begin retraining in home making so that eventually she will be able to make a better home for herself and family.

As the patient's physical condition improves and increased activity is permitted, the tempo of the educational program may be stepped up and actual vocational training may be started. We have facilities for supplying in-patient vocational training in some of the hospital professions such as nursing, laboratory and x-ray techniques. Commencement of such trade work as radio, typewriter and watch repairing may be feasible. The list of other occupations for which actual training is available within the sanatorium includes leather work, bookbinding, printing, showcard writing, stenciling, weaving, toy making and many others. The vocational experience should, as far as possible, be of a type which will aid the patient in his post-sanatorium work.

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We have recently inaugurated, with the assistance of the Hennepin County Tuberculosis Association, a series of meetings, held weekly, for all of the ambulant patients. The purpose is to acquaint them with various general features of rehabilitation, trying to emphasize the practical aspects of training for, finding and keeping a position or job. Speakers are recruited from industry and they discuss various phases of every day "job" problems. Subjects covered will vary from "How to choose an occupation" to "How to conduct yourself in an interview." Lectures of this type can be made interesting for the patient provided the lecturers are chosen carefully and topics of general interest are presented. This lecture series is a recent innovation and is still on an experimental basis.

Our aim, in the main, is to ease the patient back to work through normal industrial channels. We do not have any method, such as the Altro work shops, by which the patient may receive sheltered employment. It has been necessary to educate employers to accept patients with arrested tuberculosis as satisfactory risks. The employers have had to be taught that the ex-patient is capable physically of handling the particular job which already had been surveyed carefully by the rehabilitation counselor. The employers have had to learn that patients with arrested tuberculosis are not infectious and are not dangerous to other employees. To safeguard this educational program for employers, it is essential to follow ex-patients carefully by x-rays and clinical examinations in order to recognize relapses as early as possible. This benefits the ex-patient and protects the employer from criticism.

SUMMARY

1. Rehabilitation of the tuberculous reduces the relapse rate, replaces indigents with wage-earners and restores self-respect and self-confidence.

2. The primary purpose of rehabilitation is to aid the patient in utilizing his physical, social and economic capacities for his present and future welfare.

3. The rehabilitation counselor directs the entire program, making use of all available data, special tests and the services of other hospital departments, such as medical, social service, education and occupational therapy. She also coordinates the in-patient and ex-patient program.

4. The in-patient program stresses education and vocational training leading to resumption of work activities through usual industrial channels. The necessity for adequate post-sanatorium physical follow-up is stressed.

TUBERCULOSIS CONTROL IN COLLEGES

More tuberculosis control programs are in effect than ever before in American colleges, according to the 18th annual report of the Committee on Tuberculosis, American College Health Association. During the year 1947-1948, tuberculosis control programs were reported by 374 colleges as against six colleges in 1932. The 374 colleges having programs reported a total of 968 cases of tuberculosis found in an enrollment of 979,595, or an average of about 99 cases per 100,000. Adult groups usually show 300 to 500 cases per 100,000.

Among the faculty and administrative staffs of colleges having case-finding programs, 24 cases of tuberculosis were found, but no cases were reported by colleges without such programs. Seventy-one cases were found among food handlers and other employees in the colleges with programs, and only one case in the colleges without programs.

Altogether a total of 960 students, with their tuberculosis arrested, have returned to school to complete their college work.

PRIZE-WINNING EXHIBIT ON DISPLAY

The prize-winning exhibit "Tumors of the Lung" and "Cancer Cells in Sputum and Bronchial Secretions" has been loaned to the Armed Forces Institute of Pathology by the Mayo Foundation and is on exhibition until April 22, 1950, in the Army Medical Museum. The exhibit, prepared by Drs. J. R. McDonald, L. B. Woolner and C. Allen Good, under the technical supervision of Dr. Arthur H. Bulbulian, Director of the Museum of Medicine and Hygiene, Mayo Foundation, Rochester, Minnesota, won a prize at the American Medical Association's June meetings in Atlantic City, New Jersey, as an outstanding example of the use of a combination of colored wax reproductions and colored photographs of gross specimens and associated x-rays to illustrate a medical topic.

Further Comparative Studies in Tuberculin Skin Testing Among 2500 Students

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During September, 1947, the College Health Service at the Pennsylvania State College compared, among other procedures, the results obtained by testing incoming sophomore students for evidences of tuberculosis with intradermal PPD and the Vollmer patch test.† We felt that by again processing the incoming second-year students on this campus for the fall term in 1948 with the patch test alone and comparing these results with those obtained by the Vollmer method in 1947, we might be able to strengthen our conclusions in this regard. To implement this idea, 2546 new students, both male and female, were given patch tests in September, 1948.

We are convinced that many of the unsatisfactory features of the patch test ascribed to it in the past have been due to patches carelessly prepared by their manufacturers, improper selections of sites for testing, haphazard skin preparation, poor management of the patch after its application, failure of the medical authority to remove patch and reading of the results by individuals who have not prepared themselves properly for such interpretations.

For the above reasons, it is felt of sufficient importance to repeat verbatim a portion of our last (1947) paper. Those of us attempting to evaluate the Vollmer method, as compared with others, consider the following steps as a "must" and are extremely insistant that all the following considerations be fully observed:

1. Selection of a thin-skinned hairless site.
2. Thorough cleansing of the skin at this selected site with a fat solvent agent (acetone).
3. Complete instructions to the individual for its care following the application (sweating, bathing, showering, etc.).
4. Removal of the patch by the medical agency so as to be sure that the patch has been in place for the required amount of time.
5. Prompt and careful reading of results by physicians who have prepared themselves by study for the proper interpretations.

The preparation of the patch by its manufacturer should consist of:

1. A uniform known strength of tuberculin material used on each patch.
2. Careful mechanical application of a constant amount of the known strength of tuberculin material to each patch.

In the 1948 series we were also interested in comparing the readings at the end of 48 hours when the patch was removed by the Health Service staff physicians and its final reading result at the end of the 96-hour period. Thus, we found 1 per cent of the total readings were read positive at 48 hours and negative at 96 hours. Fifty per cent of the final positives were read negative at 48 hours showing the great importance of the 96-hour reading.

With all of the above provisions as part of our standard procedures, we quote the results of our most recent (1948) study in the following table and compare them with the 1947 totals:

Table I

Vollmer Tests—Fall Semester, 1948

MALE

Neg.-Neg.*	Pos.-Neg.*	Pos.-Pos.*	Neg.-Pos.*	Total
1515	15	219	220	1969

Neg. = 1530 = 77.7% (1948) Pos. = 22.3% (1948)
= 21.3% (1947)

FEMALE

Neg.-Neg.	Pos.-Neg.	Pos.-Pos.	Neg.-Pos.	Total
506	6	31	34	577

Neg. = 512 = 88.74% (1948) Pos. = 11.26% (1948)
= 15.5 % (1947)

Total Male and Female = 2546
Total Male and Female Pos. = 504 = 19.8% (1948)
= 20.2% (1947)

First readings were made when the patch was removed at the end of the 48-hour period. Second readings occurred at the expiration of the 96 hours.

*Headings:
Neg.-Neg. = first and second readings were negative.
Pos.-Neg. = first reading was positive, second negative.
Pos.-Pos. = first and second readings were positive.
Neg.-Pos. = first reading was negative, second positive.

Summary

In a study involving 2152 undergraduate students at Penn State College in the fall semester 1947, we showed that satisfactory and comparable results could be obtained by using patch (Vollmer) testing where its use is desirable instead of the two dose intradermal PPD test for tuberculosis.

In the fall of 1948 we verified our percentage results in the 1947 study for Vollmer testing by reprocessing a second group of 2546 undergraduates.

We also showed and emphasized the great importance of the 96-hour reading.

Reference

Krug, E. S. and Glenn, H. R.: Journal-Lancet 68:5, 1948.

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*From the College Health Service, Pennsylvania State College, State College, Pennsylvania.

†The patch test used in this series was prepared by the Lederle Laboratories Division, American Cyanamid Company.

Shall We Accept or Reject BCG Vaccine?*

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The bacillus of Calmette and Guérin (BCG) has been defined as a non-virulent bovine tubercle bacillus originally isolated from the milk of a tuberculous cow in 1906. The organism was then grown on successive transplants onto a bile potato medium for a period of thirteen years. The resulting strain was avirulent so far as animals were concerned, and was able to produce local nodular lesions in animals but there was no evidence of progression or generalization of the lesions. These inoculated animals were found to resist virulent tubercle bacilli to a great extent. As a result of these studies, Calmette et al [1] described this avirulent organism as harmless and as affording a certain degree of protection against virulent tubercle bacilli.

The first use of BCG in humans was begun by Weill-Halle [2] in Paris in 1921 and was reported in 1925. Two early events that occurred in regard to BCG led to a marked reluctance to accept the vaccine, especially in the United States. The first of these was the laboratory work of Petroff and associates [3] (1929) who dissociated BCG into rough and smooth strains and claimed [4] that the smooth strain had the ability at times to produce progressive disease in animals. Rosenthal,[5] working in Illinois, has since reported that amounts of BCG many times the human dose have been injected into animals without ever having produced progressive disease. The second discouraging event was the disaster in Lübeck, Germany, in which 271 infants received what was supposed to have been BCG vaccine by mouth and 77 of them died of progressive disease.[6] It was later reported by the Robert Koch Institute that the vaccine used was a mixture of BCG and a virulent strain of tubercle bacilli which were kept in the same incubator. Those responsible for this occurrence were imprisoned for malpractice.

European workers were not as discouraged by these reports as were those in the United States and the use of BCG was continued in Europe and studies are still in progress there. It has been estimated that the vaccine has been given to approximately 10 million subjects. Even though used since 1921 and administered to so many people, the value of BCG is still not established. In more recent years, a number of projects have been started in North America and several preliminary reports have appeared in the literature. In evaluating the work today, it must be kept in mind that some of the studies have not been well controlled, others have not been controlled at all, and a few have been carefully controlled. A few examples including some of the more important of these reports will suffice to indicate the trend of results to the present time.

The value of BCG vaccine in increasing resistance to tuberculous reinfection has been investigated under controlled conditions among some of the Indians of the United States and Alaska in a study conducted by the U. S. Office of Indian Affairs and the Henry Phipps Institute of the University of Pennsylvania.[7,8] Freshly prepared BCG vaccine was administered intracutaneously in 1935 to 1,551 American Indians ranging in age from less than one year to 20 years and to 123 newborn infants. Controls included 1,457 Indians of comparable age and living under the same conditions and 139 newborn infants. No untoward local or general reaction followed the injection of the vaccine, and in no instance did the regional lymph nodes ulcerate. The "newborn" infants were followed six to eight years and the others from nine to eleven years. The mortality rate from all causes was 3.1 per 1,000 person-years for the vaccinated and 7.2 for the controls. The mortality rate from tuberculosis was 0.4 per 1,000 person-years for the vaccinated and 3.5 for the controls. Among the newborns, of the 123 vaccinated, 7 had died, none from tuberculosis; of the 139 controls, 15 had died, 4 of those from tuberculosis.

It will be noted that the vaccine in the above study was administered intracutaneously. The disadvantage of this route of inoculation of BCG is that it often produces a slowly healing ulcer at the site of injection and in a small percentage of cases there is ulceration of the regional lymph nodes. Oral administration is not advocated because the tuberculin reaction continues to remain negative in a high percentage of those vaccinated. Subcutaneous inoculation gives rise to cold abscesses which frequently have had to be aspirated or treated surgically.

An example of a different approach to the problem may be seen in a report in 1948 on studies carried out in Oslo, Norway, by the Oslo Public Health Service.[9] The tuberculosis mortality ratio was 45 in the control group to 1 in the BCG vaccinated group, but no one was vaccinated with BCG unless he was Mantoux-negative to 1.0 mg. of Old Tuberculin while the main qualifications for inclusion in the control material is the evidence of recent infection with tuberculosis in persons who had earlier been tuberculin-negative. Such experimental methods immediately destroy any value to be obtained from a study of these tuberculosis mortality statistics!

A recently reported Chicago study [10] described a controlled experiment which has been in operation for ten years with an additional initial three years of animal research. A part of this study concerns nurses. Student nurses at the Cook County Hospital were tuberculin tested and vaccinated during their first week in training.

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*From the Students' Health Service, University of Minnesota.

They were not allowed to go on ward duty for at least one month after vaccination. These nurses have been observed seven years. Controls consisted of 199 negative reactors who were not allowed to work in the Tuberculosis Hospital. There were 142 nurses vaccinated by the intracutaneous route—a rather small group for statistical comparisons. These vaccinated nurses were allowed to work in the Tuberculosis Hospital. Pulmonary tuberculosis developed in three of the controls and none of the vaccinated group. Reactions to the vaccine such as ulceration and breaking down of lymph nodes were not seen. These authors conclude that BCG vaccination is a safe and effective procedure.

Many other experiments could be cited but these should be sufficient to indicate the necessity for extreme caution in evaluation of reports of the efficacy of BCG vaccine.

It must be remembered that, before one can accept BCG vaccination, one must adopt the theory that a positive Mantoux reaction affords some degree of protection. It is the height of inconsistency to believe that it is better to have a negative tuberculin test and then to advocate BCG vaccination to change the reaction to a positive one. Further, the tuberculin reaction is one of our most valuable diagnostic aids in tuberculosis. Mass vaccination with BCG would destroy this guidepost by causing the recipients to become reactors to tuberculin.

It is reasonable to believe that many of the controversies regarding BCG vaccination cannot be settled until a number of bacteriological and immunological problems have been solved. Dr. Dubos, in an editorial in the *American Review of Tuberculosis* (1949)[11] has summarized these problems in excellent manner. The BCG vaccine, as indicated in the beginning of this discussion, is a suspension of living tubercle bacilli. Dr. Dubos points out that the numbers of viable bacilli in the BCG vaccine prepared by standard methods and kept in fluid medium decrease rapidly, even at icebox temperatures. The vaccines currently distributed contain from 1 to 5 billion bacterial cells per cc. of fluid. Viability tests reveal, however, that only a fraction of a per cent, at times less than .001 per cent, is viable at the time of injection; therefore, to date, we have no truly standard vaccine. The conventional techniques used in the cultivation and distribution of BCG vaccine expose the bacilli to such a variety of chemical and physical trauma that any vaccine consists of an unpredictable mixture of cells possessing all degrees of physiological age and activity. It is also possible that some of the conflicting reports concerning virulence of BCG for guinea pigs may reflect differences in the physiologic state of the animals used by various investigators. As far as is known, all the strains of BCG in use are derived from the attenuated culture first obtained by Calmette and Guérin. There is no doubt that it has undergone considerable variations over the years, so that strains vary markedly in virulence.

There is no means of evaluating the degree of immunity produced by BCG. In most such tests on animals enormous doses of vaccine have been used which, of course, do not reflect the efficacy of the vaccine as used for immunization of humans. The development of a positive tuberculin test is universally used as a criterion that the vaccine has been successful but, unfortunately, the relation of tuberculin allergy to immunity is one of the most obscure aspects of the pathogenesis of tuberculosis. It is possible to render animals tuberculin positive by injecting dead tubercle bacilli into them without increasing their resistance to infection. The mechanisms which bring about immunity to tuberculosis are still unknown; therefore, it is not yet possible to devise a test that would reveal the effectiveness of BCG vaccination. In other words, the size of the immunizing dose, the antigenic potency of the vaccine at the time of inoculation, and the response of the individual in terms of resistance have to be learned.

A statement on BCG made by the American Trudeau Society, Medical Section of the National Tuberculosis Association, in the *American Review of Tuberculosis* for November 1949,[12] includes the belief that BCG vaccine prepared under acceptable conditions, and administered by approved techniques to persons negative to tuberculin, can be considered harmless. It is further stated, however, that the degree of protection is by no means complete, nor is the duration of induced relative immunity permanent or predictable. The need for further basic research is recognized and emphasized. On the basis of studies reported in the literature, the Trudeau group feels that an appreciable reduction in the incidence of clinical tuberculosis may be anticipated when certain groups of people who are likely to develop tuberculosis because of unusual exposure, inferior resistance, or both, are vaccinated; therefore, vaccination of the more vulnerable groups is recommended, provided they do not react to adequate tuberculin tests. These groups include doctors, medical students, nurses, and persons exposed to infectious tuberculosis in the home or living or working in communities of high tuberculosis mortality rates.

It should be realized that the most effective methods of controlling tuberculosis in the general population are: the improvement of living conditions and general health, public health methods and case-finding programs, prompt and adequate treatment of patients with active disease, segregation of those not amenable to accepted forms of treatment, and adequate rehabilitation.

Summary

In evaluating BCG vaccination efficacy, the following considerations must be kept in mind:

1. The literature must be studied closely to determine whether studies have been well controlled, else they lose their value.

2. Care must be taken that one does not draw conclusions from reports of observations on groups that are too small to warrant generalization.

3. BCG vaccine has been used on humans since 1921, yet we do not know whether it is effective, and, if so, how effective.

4. The theory that a positive tuberculin reaction predisposes to reinfection is not compatible with a belief in BCG vaccination. The theory that the development

of a positive tuberculin reaction indicates some degree of resistance to reinfection does explain the belief that BCG vaccination results in increased resistance.

5. The tuberculin reaction is a valuable aid in diagnosis of tuberculosis, an aid which is lost when the vaccinated individual is changed from a non-reactor to a reactor to tuberculin.

6. A number of bacteriological and immunological problems remain to be solved before many of the questions regarding BCG vaccination can be answered. These problems include standardization and stabilization of the antigenic potency of the vaccine and the response of the individual in terms of protective immunity, if any.

7. The Trudeau Society considers BCG vaccine, properly prepared and administered, to be harmless, but points out that further studies are needed before the degree of protection can be predicted.

8. The approved general control measures which have been found to be effective must be continued until further proof of efficacy of BCG vaccination is available.

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1870

THE ORIGIN OF TUBERCLE

Let me state briefly here the views of the modern school of pathology as to the origin of tubercle, as contrasted with the older doctrine. The latter held that it was a new substance—*heterologous*—formed from a certain specific exudation or deposit from the blood vessels, and that the production of this exudation was the primary step in the complex morbid process, known as *phthisis*, or *pulmonary consumption*. Virchow advanced more rational views, which have in a great measure supplanted the dogmas of the older pathology, to wit: neither pus nor tubercle, nor certain other adventitious products are derived from an *exudation*, nor are they new formations, *i. e. heterologous*, but *homologous;* types more or less modified, or normal and pre-existing structures. Pus and tubercle—for a close analogy exists between them, both as to their origin and subsequent history—are derived from two sources—connective—tissue corpuscles, and epithelium. They are simply—*i. e.* in their *nascent* condition—the normal cellular elements produced, whether as a result of irritation or of errors of nutrition, too rapidly, therefore imperfect, faulty in all respects, and incapable of organization, or of any higher life; as Niemeyer has it—a pitiful and mean production. In a few words, then—the result of too rapid cell-proliferation—a pouring forth of abortive cells in immense quantities, and the tendency and usual termination of which is the destruction by pressure and otherwise of surrounding tissues. Reinhardt (V's Cell. Path.) holds that tubercle is simply "one of the forms presented by inflammatory products, while undergoing transformation, and especially that all tubercle is inspissated pus."

C. H. Boardman: Phthisis.

Northwestern Medical and Surgical Journal 1:361, 1870

A Case of Spontaneous Hemopneumothorax

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On January 22, 1948, D. A., a high school student, white and 17 years of age, ran for a bus and fell on her knees as she tried to board. Sudden pain developed in the region of her thoracic spine, which lasted about three hours. She felt well for the next four days, then developed severe pain over the entire chest. A physician made a diagnosis of pleurisy and gave her temporary relief by taping her chest.

She came to my attention one week after the onset of the illness, and she was again distressed. The tape was removed and x-ray inspection of her chest revealed evidence of pneumothorax on the right side with fluid extending to the level of the anterior end of the fourth rib (Figure 1). Above the fluid level no evidence of disease was seen in the lung. The left lung appeared clear. Bloody fluid was aspirated from the right pleural cavity and she was admitted to the Asbury hospital on February 3, 1948. On physical examination a soft systolic murmur which was not transmitted was heard over the apex of the heart. There was flatness to percussion on the right side from the fourth thoracic vertebra down and breath sounds were absent over this area. No abnormal sign was elicited over the left lung. Her bloodpressure was 106/66 and hemoglobin was 75.5 per cent or 11.7 gm. There were 3,410,000 red blood cells and 13,900 white cells (77 per cent neutrophiles, 16 per cent lymphocytes, 2 per cent stabcells, 4 per cent eosinophiles, 1 per cent basophiles). There were 340,000 platelets. X-ray film inspection at the hospital on February 5 revealed slightly more fluid than on January 30.

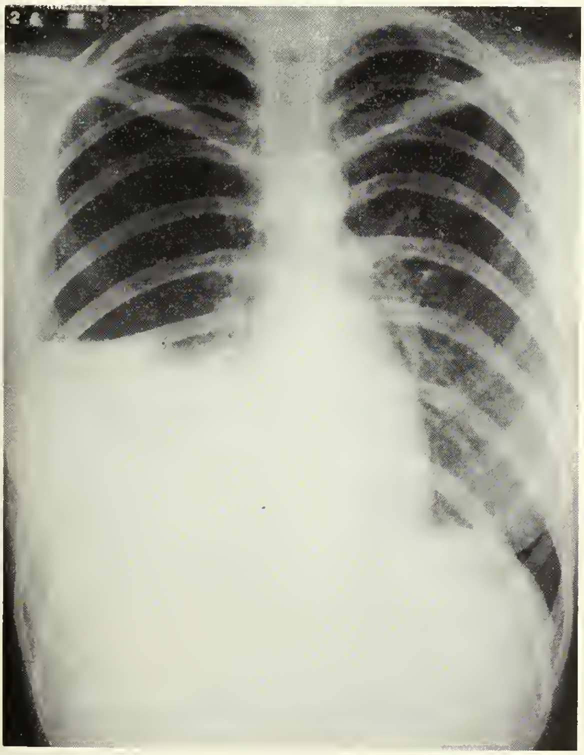

Fig. 1. Made from an x-ray film taken January 30, 1948, of the chest of a girl of 17 years. Note partial collapse of the right lung which proved to be due to spontaneous pneumothorax. The fluid in the right pleural cavity was found to be blood.

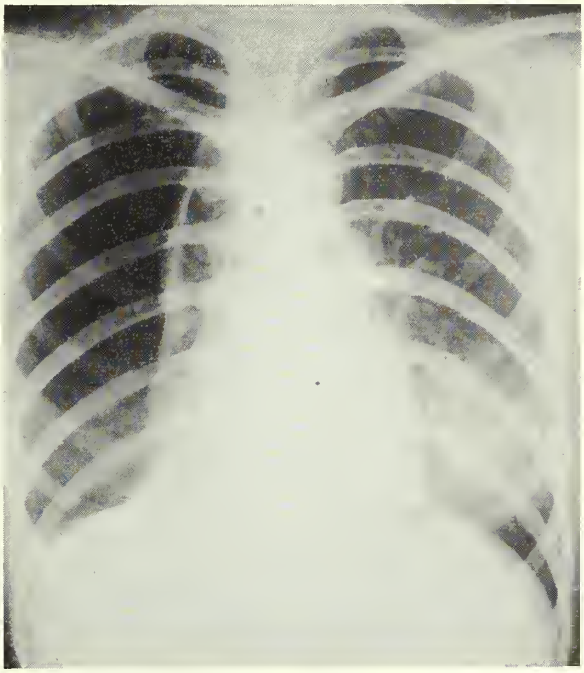

Fig. 2. Made from an x-ray film taken on February 27, 1948, of chest of same girl as in Figure 1. The right lung is almost completely collapsed. Small amount of blood remains in the right pleural cavity.

On February 6, Dr. W. H. Ford aspirated 800 cc. of bloody fluid and introduced 200,000 units of penicillin into the right pleural cavity. On the same day the patient's hemoglobin was 66 per cent or 10.3 gm. X-ray inspection on February 11 showed a slight decrease in the pneumothorax on the right side, but the fluid had risen to the level of the second rib. On February 12, 800 cc. of bloody fluid was aspirated and penicillin administered as on February 6.

Direct smear of the hemorrhagic exudate and guinea pig innoculation revealed no evidence of tubercle bacilli. She did not react to tuberculin.

On February 18, x-ray inspection revealed decrease in the collapse of the right lung with a moderate amount of fluid at the base. By February 27, she showed a great deal of clinical improvement and only a small amount of blood remained in the right pleural cavity. However there was marked increase of the pneumothorax so the right lung was almost completely collapsed. (Figure 2.)

She was discharged from the hospital on February 29, 1948, and continued to improve. On April 2, there was no evidence of fluid. The lung gradually re-expanded and appeared normal in every respect on December 13, 1948. (Figure 3.) There has been no recurrence or evidence of any other chest disease.

DISCUSSION

Hartzel reported 44 cases in 1942. This included all recorded cases since Pitt made the first report of this condition in 1900. In recent years additional cases have been reported by such workers as Helwig, Jennings, Tannenbaum, Lea, Franklin, Snively and Shuman, Payn and Lief, Warning and Nalls, making a total of about 52 cases, only two of whom were women.

Death occurs within a few days in about one third of the cases unless the condition is promptly recognized and treated. The bleeding may occur at the site of a ruptured emphysematous bleb or from pleural adhesions, which tear when or after the pneumothorax occurs. The amount of blood found at necropsy has ranged from one to four and one-half liters. Usually the blood does not clot, because of rapid defibrination by cardiorespiratory action, which results in deposition of fibrin on the pleural surface.

The onset is usually sudden and consists of sharp, stabbing and continuous pain on the involved side of the chest. The pain may remain localized or may radiate to the corresponding scapula or to the abdomen. Sometimes nausea, vomiting and diarrhea accompany the abdominal pain. In one case the admission diagnosis was acute cholecystitis and in another perforated duodenal ulcer, and operations were performed. The second diagnostic point is the pallor and unexpected severe anemia. Next is the physical findings of pneumothorax. The fourth is the rapid accumulation of fluid and the x-ray findings of hydropneumothorax.

Treatment consists of rest, aspirations of blood and air to prevent high intrapleural pressure, oxygen as needed and antibiotics to avoid serious infections.

SUMMARY

Spontaneous hemopneumothorax in a girl of 17 years is reported. Etiology was not determined. Treatment consisted of aspiration, bedrest and antibiotics. Recovery was uneventful and no residual is demonstrable by the usual examination.

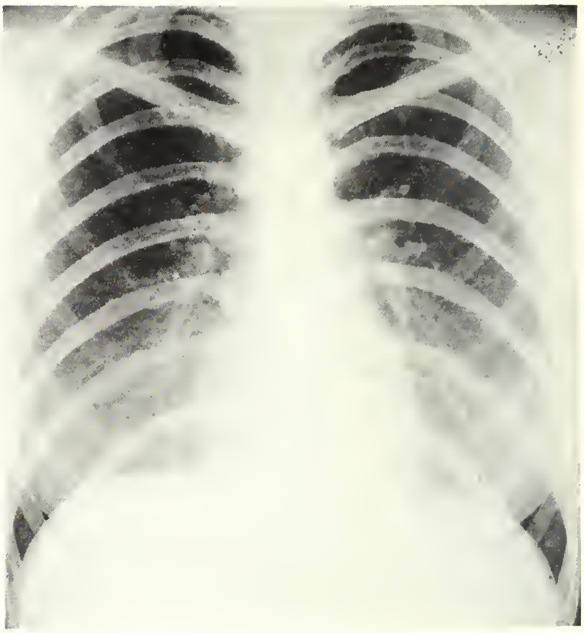

Fig. 3. Made from an x-ray film taken December 13, 1948, of chest of same girl as shown in Figure 1. No residual is seen of the hemopneumothorax. Both lungs now appear normal.

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INTERNATIONAL CONGRESS IN ROME

The first International Congress on Diseases of the Chest will be held at the Carlo Forlanini Institute, Rome, Italy, September 17-20, 1950, under the auspices of the Council on International Affairs of the American College of Chest Physicians and the Carlo Forlanini Institute. Physicians who are interested in attending the Congress should communicate at once with Dr. Chevalier L. Jackson, Chairman of the Council on International Affairs, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Ill., U.S.A.

Observations on Mass Survey and Hospital Admission X-Ray Programs

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More than ten years have passed since DeAbreu demonstrated the first mass application of photofluorography in Brazil. During this relatively brief span of time we have seen a rather remarkable expansion in the use of this technique in the field of tuberculosis control. Today more than 14,000,000 persons in every part of the country and in every kind of social and economic group are being screened for tuberculosis every year. And the individual programs range from the routine, as exemplified by hospital admission programs, to the highly concentrated, such as the screening of total community populations. Since the latter part of 1945, the United States Public Health Service has participated in 16 of the large-scale community-wide programs, and has taken part in the screening of more than 3,000,000 persons. Within the states, official and voluntary health agencies are now operating some 1,000 photofluorographic machines in the search for tuberculosis.

As a screening device and a prelude to necessary medical supervision, there can be no doubt of the survey's effectiveness. Whether it is conducted in hospitals, in communities, or among specialized population groups, the screening survey does find tuberculosis suspects—those in need of medical supervision and follow-up. In Minneapolis, for example, some 3,850 persons were found to be in need of such supervision on the basis of screening films and confirmatory 14x17-inch x-rays.

Aside from this basic observation, there are other interesting facts which are revealed in the large volume of screening work now going on in this country. It is apparent, for example, that the vast majority of tuberculosis cases discovered as the result of screening surveys—and for that matter, the majority of the active cases found—are previously unknown to health authorities. To cite the experience of the Washington, D.C., community-wide chest x-ray survey, 86 per cent of all cases clinically classified as active and inactive were previously unknown to the Department of Health as cases of tuberculosis. Moreover, 92 per cent of those classified as active cases of tuberculosis were similarly unknown.

The Minneapolis mass survey revealed much the same pattern, with 91 per cent of all demonstrably active cases unknown. In hospital screening programs, this tendency also is marked, since suspects most often come to hospitals for other than thoracic complaints.

Screening programs, moreover, succeed in finding tuberculosis cases at an earlier and more readily manageable stage of disease. Time was when the bulk of cases coming to official attention were in the advanced stages of disease. Most of them presented symptoms of some sort, ranging all the way from general debility to cough and, in some cases, hemoptysis. For the physician, diagnosis was a relatively simple matter, for even the stethoscope was a fairly useful instrument in many of these cases. For the patient, however, it often meant an extended period of treatment and poor prognosis.

The extent to which the screening survey succeeds in "turning back the clock" in terms of stage of disease at the point of case discovery can be demonstrated by citing some of the facts which have come out of these programs. In the Washington, D. C., survey, about 70 per cent of the reinfection tuberculosis cases were registered as minimal at the end of 1948. In contrast, only 35 per cent of the cases who were discovered by ordinary methods of case finding, and who were registered at the end of 1948, were of similar involvement. In other words, it would seem that the mass survey doubled the proportionate yield of minimal cases.

Earlier diagnosis seems to be resulting from hospital admission screening programs as well. Although detailed information on these programs is rather scanty, the trend seems to be the same as in more general screening programs. For example, the University of Chicago hospital found that among the first 215 clinically significant cases of tuberculosis discovered in its routine admission program, nearly 60 per cent were minimal. In another hospital program—that now being conducted at Freedmen's hospital in Washington—an analysis of x-ray films suggestive of tuberculosis reveals 65 per cent minimals.

We have learned from surveys, too, that some of our long-held notions about prevalence need to be revised. It is not altogether the young we need to be concerned about, but the old—not altogether the woman, but the man.

Surveys have shown as much as four times more active disease (that is, including those clinically classified as active, probably active, and questionably active) among people 65 to 74 years of age than among the age group 15 to 24. Moreover, it appears that the disease more frequently goes unrecognized in the older population. This has been brought out quite clearly in the Washington, D.C., survey, where only 4 per cent of the older cases processed by the survey (aged 65 and over) were previously known to the health department, as against 25 per cent of the group 34 years of age and under.

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As for the problem of relative prevalence among males and females, the Washington, D. C., survey showed an age-adjusted rate of 11.6 active cases of tuberculosis per 10,000 persons examined for men, as against one of 7.0 for women. Among the older age groups, this disparity was even more marked. In the age group 45 and over, there were 18 active cases per 10,000 persons examined among men, and less than five among women.

In the wake of screening programs, we have observed many interesting trends which can be attributed largely to the survey's stimulus. In Washington, D.C., the survey emphasized the pressing need for additional hospital beds for the tuberculous, so that some beds which had previously been closed were reopened. The phenomenal expansion in Seattle's tuberculosis bed capacity can also be laid, in part at least, to the catalytic effects of the survey; today, Seattle is hospitalizing more than twice as many cases as it did prior to the survey.

In Savannah, Georgia, which was the scene of one of the earliest large-scale screening surveys, the years prior to the survey had seen more than half of the tuberculosis deaths go unreported as living cases. In the two years following the survey, only 24 per cent of the tuberculosis deaths continued to go unreported during life.

Furthermore, in pre-survey years, only 32 per cent of Savannah's tuberculosis deaths had been reported as living cases three months or more prior to death. In the first year following the survey, however, 61 per cent were reported three months or more before death. In the year following the survey, then, approximately twice as many tuberculosis deaths were known as *cases* a substantial period of time before death. As we well know, effective tuberculosis control must be based on a knowledge of the disease in its communicable form—not on its lethal effects alone.

What exactly, can we expect of the screening survey? Dr. George Aagaard,[1] in discussing the Minneapolis survey answered this quite well when he said, "The value of this survey to the health of our community is impossible to estimate. It will depend in large measure on how well we, the physicians of the community, perform our task of arriving at an exact diagnosis and advising appropriate therapy."

For the physician, the screening survey imposes new responsibilities. We have learned that x-ray shadows of undetermined etiology are quite prevalent. Their elucidation may require employing the full range of diagnostic procedures—the kinds of procedures, for example, recommended by the Washington, D. C., Chest X-ray Survey committee of medical experts. These included:

a. Clinical histories
b. Physical examination
c. Additional x-ray studies, including fluoroscopy, stereoscopy, laminography, and lordotic films
d. Tuberculin tests
e. Laboratory studies — examinations of sputa and gastric washings
f. Bronchoscopy
g. Biopsy

There is no doubt that the etiologic differentiation of some lesions will be difficult. In some midwestern areas, where histoplasmosis is prevalent, the task will be doubly difficult. In sputum-negative cases, there may lurk an even more formidable enemy—lung cancer. And here, as Dr. Overholt [2] points out, the time element of cancer's "silent phase" imposes the additional responsibility of prompt as well as thorough evaluation in order to yield a greater proportion of resectable disease.

The task will be complicated many times over, too, by the frequency of divergent radiological and bacteriological findings. In a hospital setting, where diagnostic workup can follow upon the heels of the admission screening procedure, the difficulties can in all probability be minimized. When a patient comes to a physician's office as the result of a positive survey finding, however, the physician is himself confronted by the full diagnostic problem and responsibility.

In the Minneapolis and Washington, D. C., surveys, well over 90 per cent of all tuberculosis suspects did actually reach medical follow-up, either under public or private auspices. For many of these suspects, differential diagnosis was a most complex and difficult matter, requiring extensive workup and the most careful evaluation. To be sure, the diagnostic problem posed by many of these cases is not at all resolved by the simple report, "I have known Mr. ________ and have taken care of him for 25 years. He could not possibly have tuberculosis!" (Such a report was actually received by the medical officials of one community-wide survey.)

With the minimal case of tuberculosis, diagnosis is rarely the clear-cut matter it is in more active, progressive, and advanced cases. It may involve, frequently, the most tedious follow-up and most painstaking analysis and evaluation. These are the lesions which, under normal circumstances, rarely get the doctor's care because of their obscurity and elusiveness—those which may be forever the "silent" lesions in tuberculosis.

And even after clinical follow-up in minimal tuberculosis has confirmed the interpretation of the ill-defined x-ray shadow, the physician is faced with another and perhaps more serious problem. He must then cope with the question of the lesion's significance, and must decide upon the course of action to be taken in its management. Will the patient need to undergo hospitalization and surgical procedure? Can the lesion be managed under a home-care regimen? Or will it be sufficient to place the patient under long-term observation, imposing only token limitations upon normal activity? It will be most urgent that these questions be resolved properly and decisively.

These are but a few of the problems which our screening survey experiences in communities and hospitals pose for us and for the medical profession generally. Meeting them directly and fully is the best assurance of effective tuberculosis control.

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Mobile X-Ray Surveys and General Practice

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Mass mobile unit x-ray surveys have imposed a new dual obligation upon the general practitioner. Determination of the activity or status of the frankly tuberculous lesion, and differentiation of pulmonary tuberculosis from other intrathoracic disease found in mobile x-ray surveys are now almost invariably responsibilities of the family doctor. Coupled with these duties, there still remains the necessity for early, accurate diagnosis of tuberculosis of any case seen in practice.

Under the supervision of the Division of Tuberculosis of the Minnesota Department of Health mass x-ray surveys were conducted in Morrison County in July, 1947, and in Todd County in October, 1947. Results of these surveys furnished by Dr. H. Mark, director of this division, reveal that 18,842 persons in Morrison and 18,107 individuals in Todd County had thoracic x-ray examinations.

Among those of Morrison County examined, 32 with intrathoracic findings designated one or the other of the authors, associated in the same practice, as their family doctor. Of those included in the Todd County survey, six with pulmonary or thoracic disease named the same physicians as medical attendants. Thus, from these two county-wide surveys, a total of 38 persons depended upon this one practice for follow-up care.

According to roentgenologic interpretation of the survey films, 20 required determination of the status of the tuberculous lesion, and 18 presented the question of differentiation of pulmonary tuberculosis from other pathology noted within the chest.

Since these surveys were conducted, two years have elapsed and six persons with x-ray findings included in the surveys have not presented themselves for examination. Of the remaining 32, 18 were found to have either healed or inactive tuberculosis and 6 were found to have active tuberculous disease, a total of 24 with either inactive or active tuberculosis. This means that even though original survey data indicated that only 20 required determination of the status of the tuberculous lesion, 4 additional cases of the remaining 18 were found to have either active or inactive tuberculosis. Of these, two were originally recorded as "tuberculosis suspects" and two as showing "pleural changes."

Active Tuberculosis

Six of the entire group were found to have active lesions. One of these was a seven-year-old boy with an active primary or first infection lesion in the left upper lung field. As a result of Myers' Lymanhurst studies of such cases, home treatment was followed and resulted in healing as determined by serial x-ray studies. This and two other active cases were not diagnosed as tuberculosis prior to the survey. Two of the previously undetected active cases have had tubercle bacilli demonstrated in the sputum or pleural effusion.

Three of the active cases were diagnosed as pulmonary tuberculosis before the surveys and at one time or another revealed tubercle bacilli in the sputum. All three of the latter have been cared for at home, and all have had negative sputum for two years. One of these is a female, age 69, with an old unoperated tuberculosis of the dorsal spine in addition to the pulmonary disease. Another is a female, age 66, living with her husband and having no children and very few visitors. And the third is a male, age 75, living alone, and having no visitors except one neighbor who calls upon him once daily to see that his fuel and supplies are provided. All three of these cases have made satisfactory progress and are improving steadily. Though they steadfastly refuse to submit to sanatorium care, there is no evidence that any of them is a public health menace or is even a potential source of infection to other people.

Only one of these active cases caused any concern diagnostically. The case is that of a 52-year-old male with what appeared to be a lobar density at the right base. For various reasons he was referred to the University Hospital. Although the first evidence favored a primary carcinoma of the lung, it was finally proved to be tuberculosis and he now is under treatment in a sanatorium.

Inactive Tuberculosis

Eighteen cases required determination of the status or activity of the lesion. Of these, ten were known to have had tuberculosis prior to the mass x-ray surveys, one having been found in 1930 and one in 1934 during tuberculin testing campaigns. Four of these ten cases have been in a sanatorium for treatment of pulmonary tuberculosis, and one in Gillette State Hospital for treatment of tuberculosis of the spine. One with tuberculosis of the hip refused surgery or institutional treatment and was treated in the home. Over a period of five years, the hip became ankylosed and for the past six years he has been doing farm work without any evidence of activity of the tuberculosis. Two of these ten cases are considered healed including one with a tuberculous pleural effusion first encountered in 1932 and showing no activity since that year. Four are considered arrested including one with a tuberculoma in the left base, and four are classified as quiescent.

Of the eight cases of inactive tuberculosis first found to be tuberculous in these x-ray surveys, with the status or activity of the lesion undetermined, five revealed old healed fibrotic lesions. The remaining three were found to be inactive but were classified as arrested or apparently arrested. One of these latter cases was sent to a sanatorium for sputum and gastric washings examination and culture, all of which failed to demonstrate acid-fast organisms. When discharged from the sanatorium, this patient was advised to have continuing follow-up examinations. A second patient in this group of inactive but arrested pulmonary tuberculosis was found to have idiopathic macrocytic anemia which responded to appropriate treatment.

NON-TUBERCULOUS INTRATHORACIC PATHOLOGY

Among the 32 survey cases reporting for additional study, eight were non-tuberculous. Two of these cases, one reported as "possible artefact" and the other "suspect tuberculosis" failed to reveal any intrathoracic pathology here, at the University Hospital, or in the hands of physicians in Minneapolis, to which location one of them moved.

Three of this group of cases were proved to have the remnants of a postpneumonic pleural effusion dating back 18, 8 and 5 years respectively. Two were found to be cardiac patients, one with decompensation and pleural effusion associated with hypertensive heart disease, and the other rheumatic mitral valvular disease with cardiac enlargement. And the last case of this group was a male, 68 years of age, who 12 years ago had spontaneous pneumothorax caused by pleural blebs. His survey film was interpreted as showing "both lung fields emphysematous with large emphysematous blebs at both bases." Further study confirmed the pathology as simply pulmonary emphysema.

EXAMPLES OF CASES SEEN IN ROUTINE PRACTICE

During the same period covered in the study of survey cases, two cases were seen in routine practice which exemplify the additional responsibility of the family doctor in the differentiation of pulmonary disease. Both of these cases were indistinguishable as definite tuberculosis or pulmonary carcinoma by the roentgenologist who interpreted their films.

First of these cases was a male, age 43, who presented himself for examination complaining of fatigue, blood streaked sputum, cough, fever and pain in the right chest. X-ray study revealed a homogeneous density protruding from the hilus into the right upper lobe. He reacted to tuberculin, his sedimentation rate was elevated, but sputum tests failed to reveal tubercle bacilli. In order to permit pneumonectomy before metastasis occurred in case the lesion was carcinomatous, he was referred to a thoracic surgeon, hoping bronchoscopic biopsy would permit incontrovertible diagnosis. Biopsy, or differentiation of the two diseases were not possible without further study. He was returned home for observation, and finally gastric washings demonstrated tubercle bacilli.

In the second instance, the patient was a male, 39 years of age, who presented himself at the office as a result of weight loss and persistent cough over a period of two months. Thoracic x-ray study revealed a lesion in the right upper lobe, which the roentgenologist reported, "Findings strongly suggest bronchogenic carcinoma." Tuberculosis was not included in the differential diagnosis, even though it was considered. This patient, too, was referred for bronchoscopic biopsy and bronchography. The report in part states, "This could represent a peripheral inflammatory process, or a peripherally developed tumor mass. Material and washings from this portion of the lung were absolutely negative for tumor cells under the microscope. Material was taken for culture, and I believe that additional sputum specimens should be obtained and submitted for culture." At present, this case appears to be one of unresolved pneumonia. Further studies are in progress.

CONSULTATIVE SERVICES

Both of the last two cases and two preceding cases required consultative service. In suspected bronchogenic carcinoma, histologic proof is required before pneumonectomy. Bronchography, bronchoscopic biopsy or exploratory thoracotomy usually are necessary. For this reason, since none except possibly bronchography can properly be done in general practice, referral of such cases to a bronchoscopist or more directly to a thoracic surgeon, results in the greatest likelihood of early pneumonectomy should the lesion be cancerous.

In some instances of suspected tuberculosis or suspected activity of a tuberculous lesion, referral of cases to a sanatorium is advisable. This is advantageous in order to secure continued pulse and temperature record, repeated sedimentation rates, differential counts and other blood studies, serial roentgenograms, cultures of sputum, gastric washings or pleural exudate. When such studies cannot be done in general practice or local hospitals, the true nature or status of the lesion is determined most quickly by referring the patient to a sanatorium.

SUMMARY

In two county-wide mobile x-ray surveys involving 37,000 persons, 32 individuals with intrathoracic findings were referred to one practice for final diagnosis.

Of these, 24 were found to be tuberculous and required evaluation of the status or activity of tuberculous lesions. Six of these were found to have active and 18 inactive tuberculosis.

Eight surveyed subjects were found to be nontuberculous and required differentiation of intrathoracic disease, either cardiac or pulmonary.

Exemplifying the third group of thoracic cases in which early diagnosis by the general practitioner is a primary responsibility, two problem cases encountered in the routine of practice during the same survey period have been briefly presented.

Thus, it is seen that (1) determination of the status of tuberculous lesions, (2) differentiation of tuberculous from other intrathoracic pathology found in mass mobile unit x-ray surveys, and (3) early accurate diagnosis of pulmonary cases seen in routine practice constitute the three principal fields of responsibility of the general practitioner in the continuing efforts to eradicate tuberculosis.

Tuberculosis in China

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Tuberculosis in China is as old as China herself. For centuries the cause of this disease was not known. It was thought to be caused by extreme labor and hardship. It was also believed that young men who had too much affection for women were prone to this disease. Although tuberculosis ran in families, it was not thought to be hereditary. The fact of contagion was unrecognized. There was no specific method of diagnosis. Whenever a young man coughed up blood, or a young woman stopped menstruating a diagnosis of tuberculosis was made. These symptoms were considered as grave signs. Treatments were many, but most of them were not scientific and therefore not effective. Complete rest and good food were always emphasized. Sometimes short walks and deep breathing of outdoor air in the early morning were advised. Garlic was considered as an effective treatment by many people. A kind of nut meat, called "Pai Kuo" or "white-fruit," grown on trees in South China was, when soaked in cabbageseed oil for 100 days, considered effective in treating tuberculosis. Long, long ago, bread soaked with hot shooting fresh blood from a beheaded criminal was said to be a specific treatment.

With the modernization of China over the past 50 or 60 years, scientific medicine is now being taught and practiced. We have true knowledge regarding the etiology, diagnosis, treatment and prevention of tuberculosis.

Tuberculosis is the most prevalent disease in China. We could not obtain accurate morbidity and mortality rates for the nation as a whole, but in our working district in Peking, we have a rough mortality rate of about 230 per 100,000 population. In the city of Peking, with a population of about 2,000,000, the number of deaths from tuberculosis is about 4,600 a year. For the whole nation, with a population of 450,000,000, the total number of deaths from tuberculosis is about a million annually. In other words, about twice as many people as live in Minneapolis die from this disease each year in China. Most of our tuberculosis patients are between 20 and 30 years of age, the most productive period. So tuberculosis in China is the most serious health problem.

We realize that we can never control or eradicate tuberculosis by treating the disease when it has developed to the late, extensive stage when the patient is compelled to see the doctor. The only effective way to control it is to use public health principles and stop the spread of infection.

TUBERCULOSIS ORGANIZATIONS AND THE PEKING CONTROL CENTER

Attempts to control tuberculosis in China first started about 15 years ago, when two organizations were formed. One is the Peking Anti-Tuberculosis Association, a private community organization with the purpose of education and informing the public about the true facts of tuberculosis. The other is Peking Tuberculosis Center, which serves as an epidemiologic and preventive center for the first municipal district of the city of Peking. It covers a population of about 100,000. This center is also a teaching and demonstration institute of the Department of Public Health of the Peking Union Medical College, a Rockefeller Foundation Institution, and therefore the entire medical and nursing staff are provided by the medical college.

This center tries to obtain epidemiologic information such as the mortality and morbidity rates for this district, a difficult project, as many poor people die without the care of a doctor, and the cause of death is not obtainable. Sometimes, they are attended by poorly qualified doctors, and the diagnosis of the disease may not be correct. However, we are able to obtain some rough statistics, and with the passage of time, our data are getting more and more accurate.

PREVENTION AND CONTROL METHODS

For preventive measures we try to find all the known and unknown infectious cases and isolate and treat them. For case finding we employ the tuberculin test and x-ray. Through testing 8282 people in 1941, it was found that the infection attack rate among the population was 5 per cent per year, and 85 per cent of children at the age of 15 were infected with tubercle bacilli. At the age of 20 it was 100 per cent. With this high percentage of reactors, we use this test only on children under 15. We test the school children annually, unless they become reactors, after which they and the members of their families are given periodic x-ray inspections of the chest. Thus we try to locate the sources of infection.

Three years ago we noticed that the tuberculin reactor percentage of the children of a second-grade class of one school has always been higher than that of other children of the same age group. After a great deal of effort we persuaded the teacher of that particular class to have an examination of the chest and we found that he had extensive bilateral pulmonary tuberculosis and his sputum was full of tubercle bacilli. We promptly put him in a sanatorium. Since then, the percentage of tuberculin reactors in children in that school has never been higher than among others of the same age group in the succeeding years.

In one big store, there had been one or two deaths from tuberculosis among the employees each year for eight years. On examination of all the employees of that store, we found besides a few minimal and moderately advanced cases, one with far-advanced disease with cavity formation. This was an older assistant manager, apparently in good health, who had been in the store for about ten years. Although he was the source of infection, we failed to persuade him to go to a sanatorium, and we had no law to force him to do so. However, we have three big department stores and a large rug factory cooperating with our control program, and consequently there has not been a death from tuberculosis among the hundreds of employees in these institutions for many years. All the primary schools and high schools in our district and three universities outside the district are under our tuberculosis control program.

In 1942 it was found with x-ray inspection by some of our staff that 5.1 per cent of 4367 college students between the ages of 15 and 27 had shadow-casting lesions which were suggestive of active pulmonary tuberculosis. At the same time, it was found among 604 barber shop workers 19.2 per cent had similar shadows. This high incidence of disease among these workers is not surprising if we consider their close contact with people during their work and the crowded conditions of their living quarters.

HOSPITALS AND SANATORIA

Isolation and treatment of infectious cases are most difficult for we do not have enough sanatorium beds. In Peking we need at least 15,000 beds, but the total number available for tuberculosis cases in all the hospitals and sanatoria is not more than 500. Practically none of them is free of charge so that most of the patients can not afford to stay. In order to utilize our limited number of beds most beneficially for all patients, we limit the duration of hospitalization of most of these to three months. During this time the patient's disease is studied, methods of treatment are decided upon, and above all, an energetic education of the patient is carried out. Facts about tuberculosis are taught, as well as the technique of isolation and ways to rest both physically and mentally. Except for the cases which need prolonged strict isolation or active surgical treatment, most of the patients are discharged to continue rest and isolation in their homes, or some other less expensive place, to be followed up by our home-visiting nurses and at our clinic.

HOME NURSING SERVICE

Since most of our patients do not stay in sanatoria, our home-visiting public health nurses play an important part in our control program. They try to ascertain the sources of infection and to persuade all the contacts to come for examination, and they teach the patients and their families the principles and technique of isolation and methods of rest.

The home-nursing service is a hard job, physically and mentally. Physically, the nurses have to walk or bicycle for all their visits. They have to tolerate outdoor heat in summer and freezing cold in winter, dust on many of the poor roads on fine days, and mud on rainy days. Mentally they have to face a lot of sadness and helplessness when they visit the families made poor by the war. The whole family, parents and children, may live in a single small room. The father has to earn bread to keep them alive. The mother has to cook, take care of the children, and do some other part-time work. The children have to help with the work too. They eat the poorest kind of food that human beings can eat. In winter they can hardly get enough heat to keep them from freezing. They are beset by constant worry, misery and struggle. Nothing can be said about nutrition, sanitation, the happiness and pleasure of life. When you see this, it simply makes you sick, makes your heart ache. When one of the parents gets infectious tuberculosis what can you do? Can you advise isolation or rest? There is no social aid available. Because of the war, most of our people are poor. However, with all these difficulties, our home-visiting nurses still carry on their work most energetically, conscientiously and enthusiastically.

TREATMENT AT THE CENTER

Although so far our tuberculosis center has not been able to reduce the mortality and morbidity rate of tuberculosis in our district to any appreciable degree, we certainly have made our people conscious of tuberculosis and its infectivity, so that we usually have from 100 to 150 people who come spontaneously to our center in each afternoon clinic period for examination of their chests. As a matter of fact, we have more work than we can handle. In our center we have only four doctors, including our director, two clinic nurses, one x-ray technician, one clerk and two attendants.

We do ambulatory pneumothorax treatment on home rest and ambulatory patients. We have two pneumothorax clinics a week with 80 to 90 patients at each clinic. Two doctors do the operation, averaging three minutes for each refill or 20 patients per hour per doctor. All necessary antiseptic techniques are employed. Pre- and post-refill fluoroscopy is required.

FUTURE EDUCATION AND CONTROL PLANS

The Chinese National Tuberculosis Association was organized in 1947 with the office located in Shanghai. In the same year, about 25 local tuberculosis associations were organized in various other cities. Tuberculosis control centers were also set up in 12 big cities. A Tuberculosis Control Planning Committee was organized in 1947 under the sponsorship of the Ministry of Health of the National Central Government at Nanking.

For raising funds and public education we do not have a Christmas Seal sale, because Christmas is not a popular festival in China. But we have a New Year Seal sale.

There has been a general recognition of the need of and increasing interest in tuberculosis control work among the general population and the medical profession. In our Peking Tuberculosis Center we always have several young doctors and nurses coming from other parts of our country for training in this special kind of work. One winter, we had a young doctor from Lanchow, about 1500 miles west of Peking. Because of no other better means of transportation, he traveled in a truck in the icy and snowy desert of the Northwest. Sometimes for hundreds of miles they did not see a village or living thing in the desert. One day, when the truck was crossing the shallow Yellow River on a small ferry boat, the passengers had to go into the hip-deep water to break the ice to loosen the boat. The spirit of those seeking training in tuberculosis control work is wonderful.

Most of the Chinese people now recognize the seriousness of tuberculosis. We all know the principles of controlling this disease, and we are anxious to control and eradicate it. What we need to do is to put the principles into practice and work. In order to work, we need peace. You can not do anything when there is fighting, when destruction is going on, when people are struggling between life and death. When the war is over, which we think will be soon, and peace comes, construction and production will be started and people can live better and easier. Then we can have larger funds and the personnel to build hospitals and provide sanatorium beds, and open more tuberculosis control centers, and provide financial aid to patients and do more educational work for the public. We all believe that the complete eradication of tuberculosis from China is possible, because we know we are working along the right course. We have the will and the faith. But please give us peace and time.

Meet Our Contributors

Robert J. Anderson was graduated from the University of Minnesota Medical School, specializes in preventive medicine and public health, is now with the division of tuberculosis of the United States Public Health Service. He is a member of A.M.A., the American Public Health Association, the American College of Chest Physicians, Association of Military Surgeons, and the State and Territorial Health Officers, and is a Diplomate of the American Board of Preventive Medicine and Public Health.

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Mary L. Boice was graduated magna cum laude from the University of Minnesota in 1945, took an M.A. in applied psychology in 1947, specializes in vocational guidance. She is vocational rehabilitation counselor for the department of education, state of Minnesota, working in Hennepin County and Glen Lake Sanatorium.

★

Sumner S. Cohen, a graduate of the University of Minnesota Medical School, is assistant medical director of Glen Lake Sanatorium, serves on the board of directors of the Hennepin County TB Association, as chairman of the regional committee for postgraduate education of the American Trudeau Society, and on the TB committee of the Minnesota Medical Association. He holds membership in numerous medical societies and is a consultant for the Veterans Administration.

★

Arthur William Dahlstrom was graduated from Marquette University, entered the U. S. Indian Service in 1934, is now stationed at Sioux Sanatorium, Rapid City, South Dakota. He is a member of the American College Chest Physicians and American Trudeau Society.

★

Horace De Lien, a graduate of the University of Minnesota Medical School, has been with the Bureau of Indian Affairs for six years as a specialist in tuberculosis control. He is a member of the American Trudeau Society, American Public Health Association, NTA, American Hospital Association, AMA, South Dakota Medical Society, Northwest Medical Society, and Illinois Public Health Association.

★

George Alfred Dodds is a graduate of the University of Oregon, now specializes in thoracic and abdominal surgery. He is a member of the Fargo Clinic, chief of staff of St. Luke's Hospital, and consultant at the Veteran's Hospital in Fargo. He is a FACS, and a Diplomate of the American Board of Surgery.

★

Herbert R. Glenn is a graduate of Jefferson Medical College, and has been on the staff of State College, Pennsylvania, for the past 21 years, as director of the College Health Service. He is a member of the AMA, the Pennsylvania State Medical Association, and Centre County Medical Association.

Kenneth Kuan-Ching K'an was graduated from Peking Union Medical College in 1943. A specialist in tuberculosis control, he is at present on the staff of Glen Lake Sanatorium, Oak Terrace, Minnesota.

★

Geza Joseph Kertesz received his M.D. from the Hungarian Royal Scientific University of Budapest, has specialized in general surgery in Minneapolis for the past 19 years. He is a member of the Hennepin County Medical Society and the Minnesota State Medical Society.

★

Edwin Graham Knight is a graduate of the University of Minnesota Medical School, and has practiced medicine at Swanville, Minnesota, for the past eight years. He is a member of the Upper Mississippi Medical Society, Minnesota State Medical Association, and the AMA.

★

Gunda R. Kokatnur was graduated from the University of Minnesota in 1922, worked for 16 months in industrial medicine in copper mines of Michigan, and returned to India in 1924, where he is now surgeon and chief medical officer of the Karnatak Health Institute. He is a member of the Surgeons Association of India, the Indian Medical Association, and also holds a fellowship in the American College of Chest Physicians.

★

Edgar S. Krug, a graduate of Jefferson Medical College and a specialist in x-ray and college health work, is assistant college physician at State College, Pennsylvania. He is a member of Centre County Medical Association, Pennsylvania State Medical Association, and the AMA.

★

Jay Arthur Myers, a graduate of the University of Minnesota Medical School, is professor of medicine and preventive medicine and public health at that school. He is chief of tuberculosis service, Minneapolis General Hospital; medical director of TB activities, Minneapolis Public Health Center; and chief of chest clinic, University of Minnesota. He is a member of numerous medical and scientific societies, and a past president of the NTA.

★

Edwin J. Simons is a graduate of the University of Minnesota Medical School, specializes in internal medicine and diseases of the chest at Swanville, Minnesota. He was chief of the medical service unit of the division of social welfare from 1942-1947 and medical director of district health unit No. 8, 1948-50. He is a member of county and state medical societies, F.A.C.P., F.C.C.P., and the American Trudeau Society.

★

Ramona L. Todd is a graduate of the University of Minnesota Medical School, has been on the staff of the Students Health Service for the past seven years. She is a member of the Hennepin County Medical Society, the Minnesota State Medical Society, AMA and Sigma Xi.

The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatric Society

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Editorial

ACCOMPLISHMENTS AND FAILURE BY NEGLECT

It now appears that the United States has the lowest mortality rate from tuberculosis of any nation in the world. In 1949 this probably was in the neighborhood of 26, in contrast to approxmately 200 per 100,000 at the opening of the 20th century. In Minnesota, except for the year 1918, there has been almost a constant decrease in deaths from tuberculosis since 1911. That year the mortality rate was about 120 per 100,000 and 2522 people died, but it decreased to a rate of 13.8 with 410 deaths in 1949. Had the mortality rate of 30 years ago obtained, there would have been more than 3200 deaths from tuberculosis in Minnesota in 1949.

The mortality rate now reaches its height among those of 60 years and older. This is exceedingly encouraging as it indicates that the effort directed against the tubercle bacillus has borne choice fruit. Before such effort was put forth, those now 40 years and over were not well protected against either the bovine or the human type of tubercle bacilli. Many of them as children developed primary tuberculosis complexes which persisted in some and apparently are now responsible for many of the deaths occurring in the older age groups. On the other hand, those now under 40 years of age have benefited by protection against tubercle bacilli. Methods of prevention have been improved from time to time so that those from birth to 20 years have received greater benefit than those from 21 to 40. The number of children and young adults who develop primary tuberculosis complexes has become relatively small. Therefore the potentialities of falling ill or dying from tuberculosis have markedly decreased. It now appears that as the older persons with a relatively high incidence of tuberculous infection are replaced by the young with a low incidence, the mortality from tuberculosis will be much lower when they become old than obtains among those who are now in the old-age period. Among the 410 persons who died from tuberculosis in Minnesota in 1949, 259 were 50 years or older, of whom 129 were 65 years or over. Apparently the tubercle bacillus is making its last stand in old men. Of the 259 persons of 50 years or older who died in 1949, only 72 (27.8 per cent) were women.

Generally speaking, mortality is not a good criterion of immediate accomplishments in tuberculosis control because the majority of deaths from this disease are the result of infections which occurred long before. Therefore, for many years after an excellent tuberculosis control program is instituted in a given community, mortality may remain high among those who were infected previously.

The only good early criterion of the value of a tuberculosis control program is the incidence of tuberculin reactors among children, particularly those born since the program was instituted. In this respect the Minnesota situation is also highly satisfactory. Among grade school children, the incidence of tuberculin reactors in Minneapolis decreased from 47.3 per cent in 1926 to 7.7 in 1944. In parts of the area served by Southwestern Minnesota Sanatorium, Worthington, only 1 to 3 per cent of grade school children now react to tuberculin. In the four countries served by Riverside Sanatorium, Granite Falls, in 219 of the 277 schools, no child reacted to tuberculin in 1948. Tuberculin testing of seniors in high schools in various parts of Minnesota now rarely reveals more than 5 to 8 per cent reactors. From the limited amount of testing done, it appears that 25 per cent or less of the adults of some counties are infected with tubercle bacilli. A long waiting list for beds has been absorbed and in its place is a sizable number of vacancies in Minnesota sanatoriums.

While the accomplishments in tuberculosis control in Minnesota have been remarkable, there are nine other states with lower tuberculosis mortality rates (1948), as follows: Idaho, Iowa, Kansas, Nebraska, New Hampshire, North Dakota, Utah, Wisconsin and Wyoming. It is significant that in these 10 states which have the lowest tuberculosis mortality rates in the nation, the tuberculin test has long been extensively used as the most refined diagnostic and epidemiological agent, with x-ray film inspection of the chest of reactors, complete examination of all presenting shadow-casting lesions, isolation and treatment of those proved to have clinical or contagious tuberculosis. This is the most fundamental tuberculosis control program in existence and has resulted in greater victory over the disease than any other method ever employed anywhere in the world.

Failure due to neglect of the individual or a population of any size has led to erroneous interpretations. For example, when it was observed that such high tuberculosis morbidity and mortality rates prevailed in institutions for the mentally ill, the theory was advanced that such persons are highly susceptible and have no resistance. In reality, the serious situation was due to neglect to protect patients in these institutions against tubercle bacilli of fellow patients and personnel. Wherever adequate protection is now offered, the disease among inmates responds as it does among persons in the general population of the same area.

The high incidence of tuberculosis among American Indians caused speculation to the effect that persons of this race have no "immunity" because of the recentness of their introduction to the tubercle bacillus. However, actual observation has shown that under identical conditions Indians control their tuberculosis in precisely the same manner as their Caucasian countrymen. It was the long neglect of tuberculosis among Indians that led to the erroneous deduction. This also applies to Negroes. Indeed, there is no well-established evidence to prove that one race of people is more susceptible than another or responds less well to control measures under identical living conditions.

Neglect to protect infants against tubercle bacilli with resulting relatively high mortality during the first two or three years of life was attributed to lack of immunity in this early age. Little thought was given to the consumptive mothers, fathers, grandparents, etc., who daily transmitted tubercle bacilli to these small bodies. It was neglect that caused 68 infants in the first year of life to die from tuberculosis in Minnesota in 1916, and it was the same factor that allowed two to die in 1949. Someone neglected to find open cases of tuberculosis in contact with them. It was the same kind of neglect that allowed 268 teen-age girls and boys to die from tuberculosis in 1916, and 7 in 1949.

Thirty years ago, persons with a clear vision of tuberculosis control and ultimate eradication were harassed and handicapped in their work by those with theories which required that all persons during the period of childhood be infected with tubercle bacilli, preferably of the bovine type. They stoutly maintained that if generations of animals and people attained adulthood without such infection, they would possess no immunity and if infection then occurred, they would be swept off like poisoned flies.

Veterinarians proceeded to bring on uninfected generations of cattle so that today in Minnesota only 0.09 per cent of these animals are infected, and in the nation as a whole only 0.19 per cent. Occasionally a few now become infected among the animals from a long line of uninfected ancestors. They tolerate the disease just as well as those of former times from a long line of infected ancestors. Moreover, animals infected late in life tolerate tubercle bacilli as well as those infected while young. Physicians of 30 years ago continued to protect children against infection with tubercle bacilli, with the result that most young adults and many older ones in the 10 states heretofore mentioned have never been infected with tubercle bacilli. When the occasional one does become infected in adult life, the same form of tuberculosis develops as occurs among those infected in infancy and childhood. Therefore, the theories of 30 years ago have been found untenable.

To date no one has proved that natural infection with virulent tubercle bacilli in animals or man results in dependable immunity to clinical tuberculosis. We have no measure for immunity. We do not know how much or how little, or whether any of importance develops. If any immunity is produced we do not know whether it is cellular or humoral. Until reliable information is available there is no premise on which to base an artificial immunization program.

Attempts to immunize against tuberculosis are older than good fundamental tuberculosis control measures. They date to 1883, when Falk expressed some ideas in this general direction. From then until now, a long list of names of persons who have developed and tried so-called immunizing agents might be given, including such famous persons as Koch, Von Behring and Calmette. Each of these agents had its day and one or more has been constantly before the medical profession and the public for the last 60 years. Not one has been proved to have efficaciousness that would be of any significant help in the control and eradication of tuberculosis in animals or man. On the contrary, each one administered to humans has taken its turn at retarding fundamental methods of controlling and eradicating tuberculosis. Some, such as those of Von Behring, Calmette and the vole tubercle bacillus, sensitize tissues to tuberculoprotein and thus seriously interfere with the diagnosis among persons who subsequently develop tuberculosis. To artificially render an individual's tissues allergic to tuberculoprotein deprives him of what should be an inalienable right to have the presence of virulent tubercle bacilli detected promptly if and when they invade his body. The tuberculin test is the most potent weapon the physician has against tuberculosis. Anything that nullifies its use, such as a so-called immunizing agent, definitely handicaps and postpones accurate diagnoses and is harmful to the tuberculosis control program.

When the physician uses the words, "vaccination" and "immunity", the public thinks of almost total immunity, as obtains in smallpox. Therefore, when they are used in association with tuberculosis, a false sense of security is transmitted to the individual and the public which may result in relaxation of sanitary measures. Persons found to have contagious tuberculosis have refused to leave their homes because they have been told that their children can be immunized against the disease. Those already in institutions have insisted upon leaving because they believe the vaccine will protect their children against tubercle bacilli.

The idea is extant that vaccination with such substances as BCG will so completely control tuberculosis that the need for sanatoriums will soon vanish. The dissemination of such false statements cannot help but influence legislators and others who would ordinarily promote and support repairs and additions to old hospitals and sanatoriums and the construction of new ones when needed. It seems almost unbelievable that a method which is rapidly leading to the eradication of tuberculosis should at the present moment be so jeopardized in some parts of the world by one for which there is no premise, whose efficiency has never been satisfactorily proved, and one which has already been harmful to the tuberculosis control program. If the truth concerning so-called vaccines for tuberculosis is not soon substituted for exaggerations and unproved contentions now being widely circulated by every possible medium of expression in this country, there is grave danger that our people will be lulled into such a sense of false security as to disregard most, if not all, that has been responsible for the world's finest accomplishment in tuberculosis control. This would result in failure by neglect.

J. A. M.

News Briefs

North Dakota

Dr. L. W. Larson of Bismarck was elected chairman of the medical and scientific committee of the American Cancer Society at the society's recent convention in New York. Dr. Larson is chairman of the executive committee of the North Dakota Cancer Society, and in 1948 served as vice chairman of the national society.

* * *

Sufficient Physicians for the needs of North Dakota can be obtained by a two-year medical school at the University when it is brought up to standards, according to the unanimous opinion of the committee on medical education of the North Dakota State Medical Association. The committee met February 11, 1950, at the University in Grand Forks and canvassed the situation there.

In addition to Dr. Leigh were Drs. W. A. Wright of Williston; W. A. Liebeler of Grand Forks; H. N. Berg of Bismarck; W. F. Baillie of Fargo; J. A. McDonald of Cando; R. W. Rodgers of Dickinson; C. R. Tompkins of Grafton; W. F. Potter, dean of the medical school; and R. E. Mahowald of Grand Forks.

Meetings and Speakers . . .

Establishing the possible relationship of viruses to cancer has been the objective of 16 years of study by a former student at the University of North Dakota, Dr. Jerome T. Syverton of the University of Minnesota Medical School, who returned to his alma mater at Grand Forks, February 8, 1950, to speak to medical students and former professors.

* * *

Dr. H. M. Berg, radiologist with the Quain and Ramstad Clinic, was the guest speaker February 23, 1950, at the meeting of the Northwest District Medical Society in Minot. Dr. Berg, who with Mrs. Berg made a three months tour of England and the Scandinavian countries a year ago, discussed the status of socialized medicine in England, Norway and Sweden.

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An adjourned meeting of the North Dakota Medical Center Advisory Council was held at 10 A.M. on March 3 in the medical building at the university.

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Members of the Grand Forks Medical Auxiliary convention committee met February 17, 1950, to plan the program for the state auxiliary convention which in conjunction with that of the state medical society will be held in Grand Forks May 28 through May 30.

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The Woman's Auxiliary to the Sheyenne Valley Medical Society met at Valley City February 15, 1950, for their regular meeting. Mrs. Paul T. Cook gave a paper on "State Health Service."

New Appointments and Locations . . .

Dr. Neil A. Macdonald, a graduate of the University of North Dakota and the University of Illinois medical school, who has been located at Hope for the past six months, has opened an office in the Clinic Building in Valley City.

Dr. William S. Pollard of the Lake Region Clinic in Devils Lake will establish a practice in Maddock, North Dakota. Dr. Pollard, a graduate of the University of Manitoba Medical School, is a specialist in obstetrics and pediatrics.

Dr. Kenneth Wakefield of Winnipeg arrived in Gackle recently to assume his duties as head of the new health center. Dedication of the $80,000 center will be made as soon as weather permits. A drive is being made to raise additional funds to purchase more equipment, including an x-ray machine.

Dr. O. D. Dekker of Finley began practice at Hope, North Dakota, in the latter part of February. Dr. Dekker has his headquarters at the Hope Clinic Building, completed last August at a cost of $23,000.

Dr. Valentine Martinski has established a practice at Glen Ullin, North Dakota.

Dr. I. W. Kellogg of Fairmount was recently reappointed superintendent of public health in Richland county.

Minnesota

Dr. Russell H. Frost, director of tuberculosis work in ten Midwestern states for the veterans administration, was recently named superintendent of Glen Lake Sanatorium effective March 1. He is successor to Dr. Ernest S. Mariette, who was for 33 years superintendent of Hennepin county's hospital for the tuberculous.

* * *

Four Twin Cities doctors—Dr. Karl W. Anderson, Dr. E. T. Bell, Dr. Vernon Smith and Dr. George N. Aagaard—have been elected to the board of directors of the Minnesota Medical Foundation.

* * *

Dr. Albert E. Krieser, Mankato physician, who recently moved to Windom, was named head of the tuberculosis control unit of the Minnesota division of public institutions to succeed Dr. H. A. Burns, who held that position until his death earlier this year.

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Dr. Dolor, who was graduated from the University of Minnesota in 1938 and is now medical director of the National Lead Company, was one of three doctors to be granted the first degree of Doctor of Industrial Medicine by the University of Pittsburgh School of Medicine.

DR. ROBERT A. GOOD, who specializes in pediatrics and rheumatic fever at the University of Minnesota medical school, is one of 20 medical scientists to be named for $25,000 grants from the John and Mary R. Markle foundation of New York, N. Y.

* * *

DR. STANLEY W. OLSON, assistant director of the Mayo Foundation, was appointed dean of the college of medicine of University of Illinois.

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FOUR Mayo Clinic fellows received awards last week for superior quality graduate theses: They are Drs. B. E. Taylor, A. B. Taylor, W. B. Martin and D. S. Childs.

* * *

DR. M. O. NESHEIM, Emmons, was elected president of the Freeborn Medical Society. Other officers elected were Dr. C. E. J. Nelson, vice president; Dr. E. S. Palmerton, secretary; and Dr. R. A. Demo, treasurer.

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DR. MAURICE B. VISSCHER, professor and head of physiology at University of Minnesota, has been elected to the board of directors of the National Society for Medical Research.

* * *

GOVERNOR YOUNGDAHL has named Dr. Mellvin E. Lenander of St. Paul to membership on the Minnesota state board of medical examiners and Dr. H. Z. Giffin, Rochester, to the state board of health and vital statistics.

Hospital Staff Appointments . . .

Immanuel Hospital, Mankato: Dr. G. E. Penn, president; Dr. R. G. Hassett, vice-president; and Dr. O. H. Jones, secretary.

Willmar State Hospital: Dr. Robert B. May and Dr. Harold Grable.

Fergus Falls State Hospital: Dr. Virginia Gross, Dr. Samuel E. Bigelow, and Dr. Algot Astrom.

Fairview Hospital, Minneapolis: Dr. Loren J. Larson, general medicine; Dr. Albert J. Schroeder, pediatrics; Dr. Harold S. Ulvestad, ear, nose and throat; and Dr. Harold G. Worman, oral surgery.

St. Joseph's Hospital, Brainerd: Dr. A. M. Mulligan, chief of staff.

Hastings State Mental Hospital: Dr. Nelson Bradley, superintendent.

Maternity Hospital, Minneapolis: Dr. Ray F. Cochrane, president; Dr. Helen Haberer, secretary.

Eitel Hospital, Minneapolis: Dr. Alton C. Olson, assistant chief of staff; Dr. Melvin B. Sinykin, secretary.

Miller Memorial Hospital, St. Paul: Dr. M. G. Fredericks, chief of staff; Dr. Earl Barrett, vice chief of staff; Dr. Karl Johnson, retiring chief of staff; Dr. Kenneth Teich, executive committee member; and Dr. Mario Fischer, ex-officio member.

St. Cloud Hospital, Minneapolis: Dr. N. E. Musachio, chief of staff.

Abbott Hospital, Minneapolis: Dr. Orwood J. Campbell, president; Dr. John Haugen, vice-president; and Dr. Walter Hoffman, secretary.

St. Barnabas, Minneapolis: Dr. Arthur C. Kerkhof, chief; Dr. L. A. Whitesell, vice-chief, and Dr. Edgar A. Webb, secretary-treasurer.

Swedish Hospital, Minneapolis: Dr. J. S. Milton, president; Dr. Harold T. Gustafson, vice-president; and Dr. Staley Lundblad, secretary-treasurer.

St. Gabriel's Hospital, Little Falls: Dr. E. J. Simons, president; Dr. D. L. Johnson, vice-president; and Dr. R. J. Stein, secretary.

Glen Lake Sanatorium, Minneapolis: Dr. Russell H. Frost, superintendent.

St. Andrew's Hospital, Minneapolis: Dr. Frank E. Mork, chief of staff.

St. Mary's Hospital, Duluth: Dr. R. P. Buckely, chief of staff.

South Dakota

DR. TOM DILLION spoke on "Coronary Heart Diseases" at a meeting of the third district medical association February 9, 1950, when the association and auxiliary held their meeting in Flandreau.

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DR. G. C. REDFIELD of Rapid City Saturday was elected president of the Southwest Hernia society at the annual meeting of the group in Mineral Wells, Texas.

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THE newly-formed hospital committee of the Mobridge Chamber of Commerce, county doctors and members of the Walworth county board of commissioners met with Dr. Tom Schultz, Pierre, on February 15, 1950, at Mobridge, to discuss a proposal for building a new county hospital in Mobridge.

* * *

DR. GEORGE MCINTOSH, Eureka physician, has announced purchase of a snowsled which will be used to transport patients to the clinic here when roads are otherwise impassable. Dr. McIntosh said that the vehicle is equipped with a 90-horsepower airplane motor. It is large enough to carry two or three passengers and will accommodate a stretcher.

Deaths

DR. JOHN C. BARTON, 44, former medical advisor for claims service at veterans administration, Fort Snelling, died in Washington, D. C., February 12, 1950. A native of Two Harbors, Minn., Dr. Barton was a graduate of University of Minnesota medical school.

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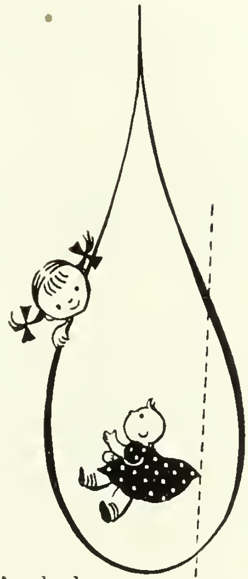
DR. JOHN DOUGLAS WATSON, 64, of St. Paul, Minnesota, died February 13. He practiced medicine from 1914 to 1940 at Holdingford, Minnesota.



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Dr. Herman L. Sarvela, 66, of Hancock, Michigan, and a former Duluthian, died February 14, 1950, in a Duluth hospital.

* * *

Dr. W. W. Nauth, 65, practicing physician in the Winona area since 1907 and one of the organizers of the Winona clinic, died at Sarasota, Florida, February 22, 1950.

* * *

Dr. E. L. Goss, who came to Carrington, North Dakota, about 47 years ago to practice medicine, and who left last June to make his home in Portland, Oregon, died Saturday, February 4, in the home of his daughter in Portland.

* * *

Dr. Park B. Jenkins, oldest country doctor of Waubay, South Dakota, died February 5 at the Tekakwitha Hospital in Sisseton. Dr. Jenkins received his M.D. degree at the University of Illinois in 1896, took a year internship in St. Mary's Hospital at Marquette, Michigan, and returned to Waubay in 1898, where he began his practice, and continued with his work for over a half a century.

* * *

Dr. J. S. Bates, a physician in Clear Lake, South Dakota, for over thirty years, but who in late years practiced at Lake Preston, died at his home in that city February 2, 1950.

Future Meetings

A continuation course in proctology will be presented at the center for continuation study of the University of Minnesota on May 22-27, 1950. Dr. George Thiele of Kansas City, visiting faculty member for the course, will discuss "The Relationship of Anorectal Diseases to General Medical Problems" and "Office Management of Common Proctologic Complaints."

* * *

A course in diseases of the eye, ear, nose, and throat to be presented at the Center on May 11-13, 1950. This course is intended for general physicians and will emphasize those EENT disorders most commonly seen by the physician in general practice

* * *

Dr. Burril Crohn, of Mt. Sinai Hospital, New York, will deliver the annual Phi Delta Epsilon Lecture at the Museum of Natural History, University of Minnesota Campus, Minneapolis, Minnesota, at 8:00 P.M., April 20, 1950. His subject will be "Regional Ileitis."

* * *

Some of the nation's foremost authorities on alcohol studies will meet at the University of Wisconsin from August 21 to 26 to tackle the problem of alcoholism and discuss recent scientific developments in the field. For information concerning the session write Professor Miller, 206 Extension Building, University of Wisconsin, Madison.

* * *

The third annual meeting of the American Association of Blood Banks is being planned for October 12, 13, 14th at The Stevens Hotel in Chicago.

Book Reviews

The Physiology of Thought, by Harold Bailey, M.D., F.A.C.S. 314 pages. New York: The William-Frederick Press, 1949. $3.75.

* * *

The thesis of this book is that life is the product of a function and the function is thought. The author treats the physiology of thought more from the sociological point of view than from the technical "test-tube and microscope" point of view. He does, however, bring in a small amount of technical, scientific explanation of physiology of thought—only enough to make his sociological and psychological explanations easier to understand.

Various chapters include a discussion of conscious and subconscious thought (the difference lying only in degree and intensity of thought), classes and sources of memories, description of sleep and why it comes to us or does not come to us. The author takes the point of view that dreams are rather useless as tools for interpretation of deep emotional conflicts and disposes of them quite easily! One chapter discusses illusions and hallucinations, and as an addition to the discourse on thought and consciousness, is interesting and worthwhile. The idea that is most interesting in this book is the author's thesis of the physiology of heredity and instinct—as inherited memories. The explanation is simple—perhaps too simple.

The psychosomatic approach to medicine is held in this book, as the author treats the body as a whole. The mind is a special development of the nervous system and there are no bridges to cross between the body and the mind. The average reader can find use in this book by the application of theories therein discussed to mental hygiene. The theories are simply explained and their application to mental health is easily applied and understood. E.B.B.

Community Health, 3rd ed., by Laurence B. Chenoweth and W. R. Morrison. Appleton-Century-Crofts, Inc. New York: (Oct. 26) 1949.

* * *

This third edition of Chenoweth and Morrison's *Community Health* is a revision of a college text, the first edition of which appeared in 1934 under the title *Community Hygiene* and the second edition in 1941. The material has been rearranged and much of it has been brought up to date. Most of the illustrative tables have been re-done and recent data added, but a few of those in the early chapters present statistics that are so old as to be of little value for present-day teaching.

The book meets most of the needs of college courses in community health and the topics are usually discussed in simple terminology. A description of podalic version and its invention on page 81 of the text, while of historic importance in medicine, hardly adds to the average college student's fund of useful knowledge. However, much of the historical information contained in the book will contribute to the reader's general understanding of the development of medicine. R.L.T.

Invited and Conquered, by J. Arthur Myers, Ph.D., M.D., Minnesota Public Health Association, St. Paul, Minnesota, 737 pages, 365 illustrations, 1949, $6.50.

* * *

This engrossing book, written in the author's customary pleasing style, and dedicated to one of the most persistent yet unsung foes of the disease was particularly timely for the centennial year in documenting all the significant contributions and developments in tuberculosis in Minnesota during the past 100 years. Every incident and detail of anti-tuberculosis work, from the earliest pioneer days in 1659 through the most recent diagnostic technics of photofluorography and therapeutic procedures such as lobectomy and pneumonectomy, are presented in chronological sequence. More than 1,900 persons who have played some role in the conquest of the malady are accorded their proper place in the fight. Pictorially also, in adidtion to the photographs of 245 people engaged in tuberculosis control, 120 illustrations and 14 graphs enhance the value of the book. It is a monumental and much needed documentation of medical history, correlating activities within this state with the advances in tuberculosis throughout the world.

The
JOURNAL
LANCET

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

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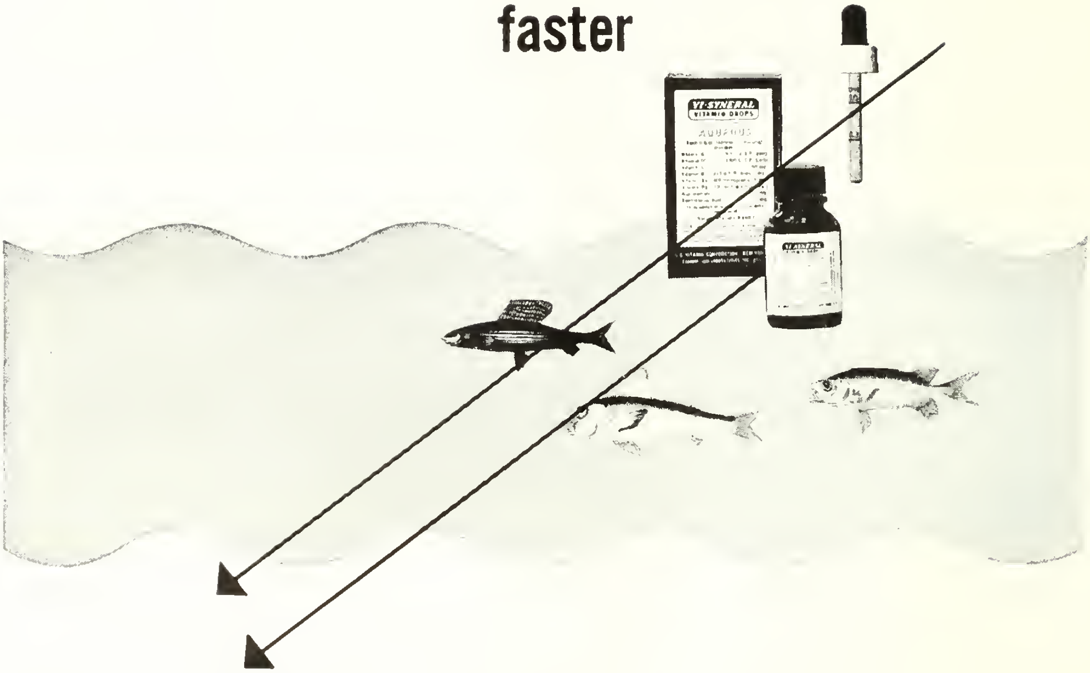

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The JOURNAL LANCET

Minneapolis, Minnesota
May, 1950

Vol. LXX, No. 5
New Series

Right Heart Catheterization in Acyanotic Congenital Heart Disease

*A Comparative Evaluation of the Diagnosis, by Clinical, Roentgenological, and Catheterization Studies in 40 Patients**

Forrest H. Adams, M.D., John W. LaBree, M.D. and Herbert M. Stauffer, M.D.†
Minneapolis, Minnesota

Right heart catheterization, as originally described by Cournand and Ranges,[1] has been used by others to study the cardiac physiology, particularly the cardiac output, under various conditions. It has been used extensively in the study of various types of shock, pulmonary, renal, hepatic and cardiac disease. Bing[2,3,4] has used the technic to study primarily *cyanotic* congenital heart disease and Cournand[5] has used it to study primarily *acyanotic* congenital heart disease.

No one, however, has used the catheterization technic particularly to ascertain the limitations of the clinical and x-ray diagnosis in congenital heart disease. Likewise, the limitations of the diagnosis by catheterization have not been particularly emphasized. In conjunction with our other studies in congenital heart disease, we have attempted to make such an evaluation. This is a preliminary report on the first forty patients studied with acyanotic congenital heart disease.‡

Methods of Study

All of the patients studied in this series were followed extensively either at the University Hospitals, the St. Paul Childrens Hospital Heart Clinic or by a private physician well qualified in the diagnosis of heart disease. For the most part, the patients studied were diagnostic problems. The clinical diagnosis used in this study was obtained from one of the above three sources, depending upon the case. In each instance the diagnosis was based upon a careful history, physical examination, electrocardiogram, routine blood count, and in some instances the physician took into account the x-ray and fluoroscopic examination results. The x-ray diagnosis referred to in each of the tables in each instance was made by Dr. Leo G. Rigler, professor of radiology, using only the standard films made available to him. No information relative to the physical findings, or the history of the case in question other than the absence of cyanosis, were

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*From the departments of pediatrics, medicine and radiology, University of Minnesota Medical School.

This work was performed under a cooperative agreement between the University of Minnesota and the National Heart Institute, Public Health Service, Bethesda, Maryland.

Presented before the Northwest Pediatric Society meeting, September 30, 1949.

†At present Associate Professor of Radiology, Temple University Medical School, Philadelphia.

‡Since the presentation of this paper, we have studied approximately 100 more patients, the results of which will be published elsewhere.

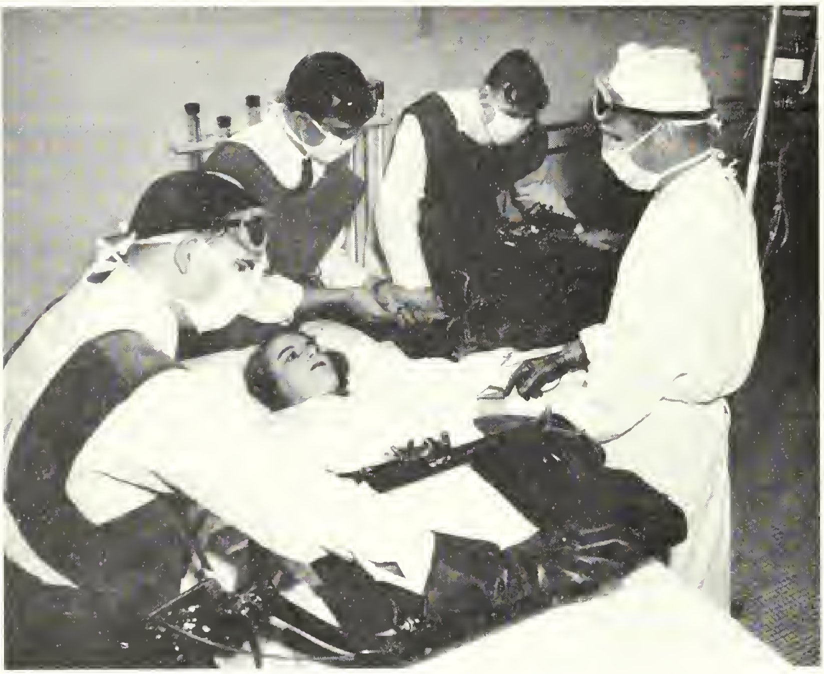

Fig. 1. Heart catheterization team and setup showing radiologist, patient, member drawing blood sample, member recording pressures, and member performing the catheterization.

available to him as an aid in the diagnosis. Frequently the fluoroscopic findings in the individual patients were not available to him. The electrocardiographic results were interpreted by us from the three standard leads.

RIGHT HEART CATHETERIZATION TECHNIC

Under sterile precautions, using local procaine anesthesia, a modified No. 8 or No. 9 ureteral catheter was inserted, usually into the left antecubital vein after a cutdown had been made. The catheter was advanced by one member of the team under direct vision, using a fluoroscope operated by a trained radiologist. (See Figure 1.) The free end of the catheter was attached to a three-way stopcock into which could run fluid from a reservoir or, if the valve was turned, pressure recordings could be made with the connected manometers. Originally, a Hamilton manometer was used, but the majority of these studies were done using a strain-gauge manometer because of its compactness.

The catheter was advanced into the various chambers of the heart where pressure recordings were made, and several blood samples were removed under oil for oxygen content analysis. An attempt was made in each patient to get the catheter into both the right and left branches of the pulmonary artery, down the ductus arteriosus

TABLE I

Pressure and Blood Oxygen Values in Various Cardiac Conditions

	Intracardiac Pressure in mm. of Mercury		Blood Oxygen Saturation in %*				
Lesion	Rt Vent.	Pulm. Art.	Vena Cava	Rt. Atrium	Rt. Vent.	Pulm. Art.	Fem. Art.
Normal	25 ± 5 0	25 ± 5 10 ± 2	75 ± 5	75 ± 15	75 ± 5	75 ± 5	97 ± 3
Inter-atrial defect	Normal or elevated	Same as R. V.	Normal	Increased	Same as R. A.	Same as R. A.	Normal
Inter-vent defect	Normal or elevated	Same as R. V.	Normal	Normal	Increased	Same as R. V.	Normal
Patent ductus	Normal or elevated	Same as R. V.	Normal	Normal	Normal	Increased	Normal
Isolated Pulmonic stenosis	Elevated	Normal or low	Low or normal	Same as V. C.	Same as V. C.	Same as V. C.	Normal
Tetralogy of Fallot	Elevated	Normal or low	Low	Same as V. C.	Increased over R. A.	Same as R. V.	Low
Eisenmenger complex	Elevated	Elevated	Low	Same as V. C.	Increased over R. A.	Same as R. V.	Low
Anomalous pulm. vein	Normal or elevated	Same as R. V.	Normal	Increased	Same as R. A.	Same as R. A.	Normal

* Oxygen content in volumes %, divided by oxygen capacity x 100

(if it was felt that it might be present), into the base and apex of the right ventricle, into two different places in the right atrium, into the inferior vena cava, into anomalous pulmonary veins, through septal defects and finally in the superior vena cava. Normal values for the pressure and oxygen content of most of these areas has previously been determined. These values plus the direction of change found in a number of the acyanotic conditions can be seen in Table I.

The pressures in the various areas were recorded by means of a camera, using a string galvanometer, which was calibrated against a mercury manometer in millimeters of mercury. The oxygen determinations on the blood were done on a Van Slyke apparatus according to the method of Van Slyke and Neill.

Older children received only atropine premedication. Children under eight years of age usually required a basal anesthesia. More frequently, rectal avertin was used; however, occasionally rectal pantothol was used. The patients received penicillin parenterally before and after the procedure, and penicillin was also placed in the solution in the reservoir. A small amount of heparin was likewise added to the solution in the reservoir to prevent any clotting of blood in the catheter. The total fluoroscopic time was regulated by a fluoroscopic timer, and in most instances it was limited to 10 minutes.

Results

A. *Patent ductus arteriosus*

The results obtained in 10 of the patients catheterized suggested the presence of a patent ductus arteriosus or an aortic pulmonary window type of defect (see Table II). Nine of these patients were operated upon. In eight, a patent ductus arteriosus was found and was ligated and divided, thus confirming the catheterization diagnosis. In one of the patients explored surgically, no patent ductus was found. However, the base of the heart was not examined for anaortic pulmonary window, and it is quite probable that this patient had such a defect. The tenth patient has not yet been explored, but it is felt clinically that she too has an aortic-pulmonary window.

Four of the patients in this group had pulmonary hypertension. One had pulmonary stenosis of a moderate degree in addition to a patent ductus arteriosus.

TABLE II

Patent Ductus Arteriosus or Aortic-Pulmonary Window

			Pressure - mm. Hg.				O_2 Content - Vol. %									
Pt.	Age	Sex	R. A.	R. V.	P. A.	Other	S. V. C.	R. A.	R. V.	P. A.	F. A.	Other	ECG	Clin. Diag.	X-ray Diag.	Cath. Diag.
S.B.	4	F	4/-10	55/0	48/40	Aorta 100/40 Ductus 50/30	8.6	9.3	9.2	11.4	—	Aorta 12.7	Hi QRS	IAD	IAD	PDA
M.B.	7	F		28/6	20/14	Aorta 110/80	11.8	11.3	—	13.5		Aorta 14.8	RAD	PDA	PDA	PDA
A.K.	12	F	6/2	30/0	24/10		12.1	12.1	11.8	13.7	16.7	Pulm. "cap" 16.7	RAD	Complicated PDA	Normal	PDA
M.P.	18	M	4	45/0	38/12		—	12.3	11.4	15.2	16.7		Broad P_1, Hi QRS	PDA	PDA	PDA
L.P.	14	F	2/-4	20/0	—	Aorta 80/40	10.3	10.8	11.6	—	—	Aorta 14.3	Pkd P_2 & P_3	PDA	Normal	PDA
C.W.	9	F	10/-2	50/-5	44/26		10.0	9.5	9.8	12.1	13.3		Extra systoles	Complicated PDA	PDA	PDA
S.H.	6	F	2/-10	70/10	28/18		10.2	10.4	10.0	11.0	—	Aorta 13.3	RAD	PDA	PS	PDA $\bar{c}$ PS
D.J.	15	M	—	24/0	20/10		13.3	11.5	13.9	14.4	17.2		Normal	PDA	PDA	PDA
M.K.	11	F	—	16/0	12/10		11.2	11.1	11.7	12.9	13.8		Normal	PDA	Aortic regurgitation	PDA*
J.A.	7	F	—	64/20	76/60		14.0	12.0	13.8	16.2	17.5		RAD & LAD	IVD	IAD	A-P window

* Disproved at surgery, probably aortic-pulmonary window.

KEY TO ABBREVIATIONS (For this and following tables)

1. Pulm. Cap—pulmonary capillary blood sample
2. P.V.—pulmonary vein
3. RAD—right axis deviation
4. LAD—left axis deviation
5. RBBB—right bundle branch block
6. PDA—patent ductus arteriosus
7. IAD—interatrial septal defect
8. IVD—interventricular septal defect
9. PS—pulmonary stenosis
10. Tetrad—tetralogy of Fallot
11. F.V.—femoral vein

All but two of the patients had abnormal electrocardiograms, the usual abnormality being a right axis deviation. In four instances the catheter was passed into the ductus arteriosus and down the aorta, thus establishing the diagnosis with certainty. (See Figure 2.)

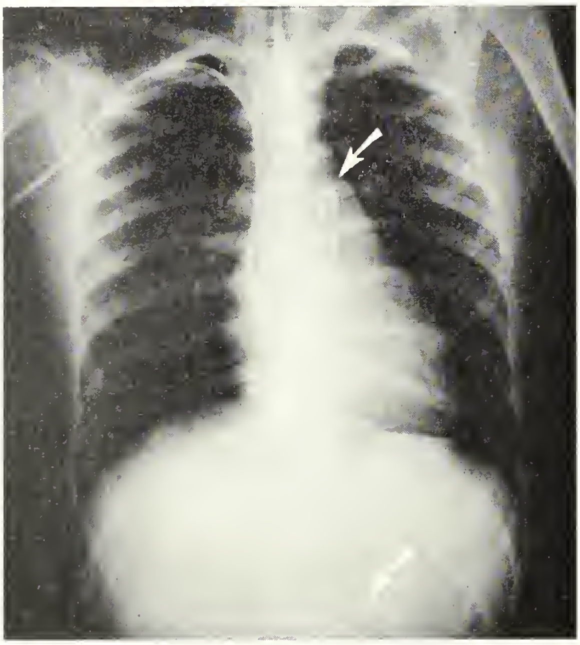

Fig. 2. X-ray showing catheter passing through patent ductus arteriosus (upper arrow), down descending aorta and into the left renal artery (lower arrow).

From Table II it can be seen that the clinical diagnosis was the same as the catheterization diagnosis in six of the ten patients. The x-ray diagnosis was the same as the catheterization diagnosis in four of the ten patients.

B. *Interatrial septal defect*

Eleven of the patients catheterized had results that suggested an interatrial septal defect (see Table III). In four instances this was definitely proved, as the catheter passed through the defect into the left atrium (see Figure 3). Two of the eleven patients had pulmonary hypertension, and in two the pulmonary artery was not entered. All of the patients (in one the information was not available) had abnormal electrocardiograms consisting usually of right axis deviation. One patient had left axis deviation, and three had a heart block.

From Table III it can be seen that the clinical diagnosis was the same as the catheterization diagnosis in seven of the eleven patients, and also the x-ray diagnosis was the same as the catheterization in seven of the eleven patients.

C. *Interventricular septal defect*

In five of the patients catheterized, the results suggested an interventricular septal defect (see Table IV). Four of these had right ventricular hypertension. The clinical diagnosis was the same as the catheterization diagnosis in one of these patients, and the x-ray diagnosis was different than the catheterization in all five patients.

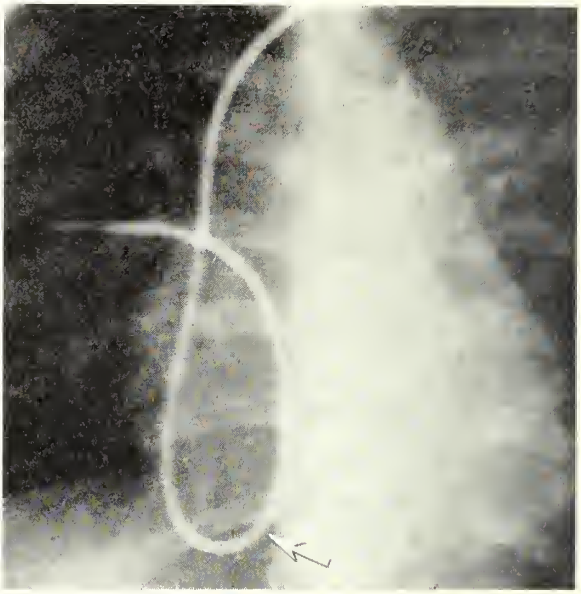

Fig. 3. X-ray showing catheter passing through interatrial septal defect (arrow), into left atrium and out into right pulmonary vein. Blood removed from this area was 100 per cent saturated with oxygen.

D. *Miscellaneous conditions*

Eleven patients were catheterized and results were obtained that have been interpreted variously such as: normal, pure pulmonary stenosis, anomalous pulmonary vein emptying into the right atrium (see Figure 4), subaortic stenosis and tetralogy of Fallot (see Table V). In this group, the clinical diagnosis was the same as the catheterization diagnosis in one of the eleven patients. The x-ray diagnosis was the same as the catheterization diagnosis in seven of the eleven patients.

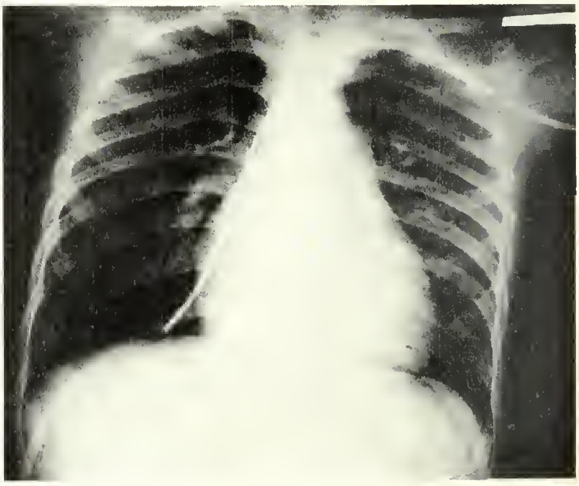

Fig. 4. X-ray showing catheter passing into an anomalous pulmonary vein emptying into the right atrium. Blood removed from this area was 100 per cent saturated with oxygen.

TABLE III
Interatrial Septal Defect

			Pressure - mm. Hg.				O_2 Content - Vol. %									
Pt.	Age	Sex	R. A.	R. V.	P. A.	Other	S. V. C.	R. A.	R. V.	P. A.	F. A.	Other	ECG	Clin. Diag.	X-ray Diag.	Cath. Diag.
G.B.	5	F	—	28/-10	26/6		8.7	11.4	11.8	12.0	13.2	L.A. 13.6	RAD	PDA	Normal	IAD
S.D.	12	F	—	120/0	—	P.V. 10/0	10.9	13.0	16.0	—	17.0	P.V. 17.7	RAD, Prolonged P-R	IAD	IAD	IAD
D.E.	17	F	—	25/0	20/5		10.6	13.6	14.8	14.9	16.7		RAD	IAD	PDA	IAD
D.E.	20	F	—	?	8/4		8.8	15.0	15.3	15.3	15,9		RAD Extra systoles	IAD	IAD	IAD
W.K.	23	M	10/0	—	—	P.V. 10/6	13.7	13.6	—	—	19.3	P.V. 19.4 L.A. 19.2	RAD	PDA	PS	IAD
R.L.	12	M	4/-4	32/0	18.6		10.7	15.4	15.6	15.6	17.2		RAD, Neg P_2	IAD	IAD	IAD
L.R.	6	F	—	70/0	50/30	P.V. 18/8	10.3	8.6	11.6	12.1	—	P.V. 14.0	Tend LAD	IAD	IAD	IAD
E.B.	62	M	18/5	75/0	72/20		10.6	15.2	14.0	15.0	19.8		—	Bernheim	AS	IAD
J.H.	17	M	7/2	30/0	14/7		12.0	16.1	16.1	16.3	17.8		Tend RAD RBBB	IAD $\bar{c}$ PDA	IAD	IAD
D.W.	12	M	—	28/0	24/6		8.9	13.5	13.3	14.0	16.0		Tend RAD $\bar{c}$ Block	IAD	IAD	IAD
S.D.	9	F	2/-2	.20/0	16/8		10.9	13.8	14.0	13.6	17.0		RAD	IAD	IAD	IAD

E. *Equivocal results*

Three patients catheterized had results that were so equivocal that no just conclusions of a positive nature could be made (see Table VI). Two of these patients, however, had a definite hypertension of the right ventricle.

F. *Analysis of total results*

The clinical and catheterization diagnosis were the same in fifteen (41 per cent) of the thirty-seven in whom the results were considered satisfactory. The x-ray and catheterization diagnosis were the same in eighteen (53 per cent) of the thirty-seven patients. In three of the forty patients, the results were so equivocal that no definite conclusion could be made.

DISCUSSION

This preliminary study on forty patients with various congenital cardiac problems has shown both the value and the limitation of right-heart catheterization as an aid in the diagnosis of congenital defects. Most of the patients included in this study had unusual features to their disease which made the clinical and x-ray diagnosis difficult or unreliable by the ordinary methods. The total results revealed that the clinical diagnosis and the x-ray diagnosis were reliable in approximately one-half of the cases only (41 per cent and 53 per cent respectively). In spite of these results, we agree for the most part with Shapiro,[6] that most congenital cardiac defects can be diagnosed using the ordinary methods. Thus,

TABLE IV
Interventricular Septal Defect

			Pressure - mm. Hg.			O_2 Content - Vol. %								
Pt.	Age	Sex	R. A.	R. V.	P. A.	S. V. C.	R. A.	R. V.	P. A.	F. A.	ECG	Clin. Diag.	X-ray Diag.	Cath. Diag.
W.B.	5	M	4/0	40/0	20/3	11.2	10.7	12.9	13.0	15.4	Normal	IAD	PDA	IVD
S.C.	5	F	—	25/0	25/15	11.3	11.2	12.3	12.6	14.5	LAD	IAD	IAD	IVD
D.S.	7	M	6/-8	40/8	—	10.6	10.6	11.5	—	16.5	Normal	IVD	Normal	IVD
J.T.	22	M		60/0	60/10	10.5	12.2	15.3	14.8	17.4	—	A-P window	Cardiac enlarg.	IVD
R.G.	14	M	6/0	58/0	40/0	10.1	9.9	13.5	13.7	14.5	Neg. ST_2	PDA	Aortic plus PS	IVD

TABLE V
Miscellaneous Conditions

			Pressure - mm. Hg.				O_2 Content - Vol. %									
Pt.	Age	Sex	R. A.	R. V.	P. A.	Other	S. V. C.	R. A.	R. V.	P. A.	F. A.	Other	ECG	Clin. Diag.	X-ray Diag.	Cath. Diag.
L.H.	7	F	18/-4	26/0	34/18		12.4	11.6	11.8	11.6	—		T RAD	IVD	PDA	Normal
A.V.	16	M		22/-6	14/8		16.3	16.6	15.9	15.7	18.5		Normal	PDA	Normal	Normal
W.T.	41	M		30/0	30/10		13.1	12.9	13.0	12.8	17.1		Normal	IAD	IAD	Normal
J.N.	16	M		160/20	12/8		11.9	12.1	—	11.1	17.4		RAD	IAD	PS	PS
R.S.	15	M	6/-5	150/0	24/10-		13.4	12.3	13.5	14.4	20.2		RAD	IAD	PS	PS
E.L.	16	F	—	18/0	18/8		11.5	10.6	10.3	10.7	14.9		Normal	IVD	Normal	Normal
B.B.	14	F	—	30/0	16/6		12.3	12.4	12.7	12.8	17.2		Pkd P_2	IAD	Normal	Normal
C.C.	12	F	4/-4	26/0	12/4		10.9	11.4	11.8	12.1	14.4		T LAD	IAD	IVD	Normal
I.C.	15	F	6/-2	26/0	26/6	P.V. 14/6	13.6	14.5	15.0	14.4	16.3	P.V. 15.9	RAD	IAD	IAD	Anom. pulm. vein
J.F.	5	M	4/0	100/0	—		13.0	12.8	13.2	—	15.8		RAD	IAD	Tetrad	Tetrad
D.H.	9	F	10/-10	54/0	48/26		11.0	10.6	10.9	11.0	14.7		Diph T_2 Neg ST_2	SAS	SAS	SAS

if heart catheterization were to be performed in *all* cases of acyanotic congenital heart disease, we would expect to find a good agreement with the clinical diagnosis in the majority of instances. The real value of heart catheterization, therefore, is obviously in that group of patients with unusual features to their disease. In subsequent papers we hope to elaborate more on the clinical and x-ray variations in the different defects.

The roentgenologist is limited in his ability to diagnose the type of defect particularly when the cardiac silhouette is within normal limits, as it so often is in patients with patent ductus arteriosus and interventricular septal defect. Most of the limitations in heart catheterization are due to lack of experience on the part of members of the team. However, even with experience, one occasionally is unable to advance the catheter as desired, and, of course, problems can always occur with the equipment. Heart catheterization is not a procedure to be undertaken lightly, and there are certain potential dangers to the patient, such as air embolism, bacterial endocarditis, thrombophlebitis. We have observed none of the complications just mentioned in any of our patients; however, an occasional patient has had extrasystoles during the procedure which were of short duration. The procedure is time-consuming and expensive.

Very small intracardiac defects and shunts probably are missed by heart catheterization unless the catheter can be advanced through the defect. The blood analysis for the oxygen content, under the conditions of our laboratory, has been accurate within 0.3 volume per cent only, and, therefore, small changes in the oxygen content of the blood due to small shunts are probably not elicited.

SUMMARY

1. Right heart catheterization is of great value in determining the correct diagnosis of acyanotic congenital heart disease when the patient's disease is atypical.

2. In this series of patients, the clinical and x-ray diagnosis were the same as the catheterization diagnosis in 41 and 53 per cent respectively.

3. The clinical diagnosis appeared to be more reliable in patients with patent ductus arteriosus and the x-ray diagnosis was more reliable in patients with interatrial septal defects.

TABLE VI
Equivocal Cases

			Pressure - mm. Hg			O_2 Content - Vol. %									
Pt	Age	Sex	R. A.	R. V.	P. A.	S. V. C.	R. A.	R. V.	P. A.	F. A.	Other	ECG	Clin. Diag.	X-ray Diag.	Cath. Diag.
R G	11	M		26/0			13.4	13.9	—	16.8	F.V. 12.2	Tend RAD	IVD	Normal	
C S	7	M	2/-6	86/0	56/24	10.3	10.2	9.9	9.7	14.6			PDA?	PS	
J W	13	M		90/0		10.7	9.8	9.2		14.3		RAD	IAD	IAD	

4. The limitations of heart catheterization were mainly those due to lack of experience of members of the team.

5. In a number of instances the catheter was passed into the patent ductus arteriosus, through septal defects and into an anomalous pulmonary vein emptying into the right atrium, thus establishing the diagnosis with certainty.

* * *

We wish to thank Dr. Paul Dwan for his encouragement and help in getting the procedure of heart catheterization started at the University Hospitals. We are indebted to Dr. Dwan and to Dr. M. J. Shapiro for the patients that they referred to us. Dr. George Veasy, Fellow in pediatrics, and Dr. Joseph Jorgens, Fellow in radiology, assisted us in some of these studies.

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CEREBRAL PALSY PROJECT IN JAMESTOWN

An interesting and worthwhile project was conducted in the summer of 1949 at Jamestown, North Dakota, by the Jamestown Crippled Children's School and the North Dakota Chapter of the National Society for Crippled Children and Adults. The purpose of the project, in which a number of cerebral palsied children and one or both of their parents spent four weeks at the school, was:

> To give severely crippled cerebral palsied children intensive therapy training in order to determine what can be done to improve their physical condition and speech; to help parents in the care of their cerebral palsied child by giving them positive suggestions for home training and techniques for home practice; and to make parents of severely handicapped cerebral palsied children realize that professional people in the field are interested in their problems and want to help them by working with them.

Each parent received a report from the nurse, therapists, and supervisor on changes in routine which seemed to be helpful in the child's adjustment to his program and general physical condition. Parents learned occupational, physical, and speech therapy techniques and new ways of combining therapy and play. A parents' workshop was set up where equipment, prescribed by the therapists, could be made for their children before they left the summer training program. Each parent also had an opportunity for personal consultation with a psychologist and medical social worker on problems concerning education, discipline, financial help, and family adjustment. Facts, which had been substantiated by observation and testing, concerning the mental ability of the child were discussed with the parents, and, last but not least, the parents had an opportunity to discuss their mutual problems with other parents of cerebral palsied children. Other parents' institutes have been held by local chapters of the National Society for Crippled Children and Adults in Wyoming, Montana, Georgia, California, Iowa, North and South Carolina, and Rhode Island.

From *Public Affairs Pamphlet No.* 158

Myocardial Failure in Children with Brain Involvement

Two cases: male of three years with encephalitis; male of seven years, with hemiplegia

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The enumeration of various cardiovascular syndromes in pediatrics, with the "living" pathology, as demonstrated by clinical appraisal, various diagnostic tests, and postmortem studies, is in the statistical stage. If we can put all our conclusions on the shelf and gather accurate data on the life histories of our patients with heart involvement many new viewpoints may be obtained. Of necessity the pediatrician must work in close cooperation with the general practitioner and the internist. An understanding of "aging" may demand an understanding of changes during the years of growth.

In the cases to be briefly reviewed it has been a unique privilege to cooperate with Dr. Paul Kortsch and Dr. W. K. Foster† who referred cases D.B. and D.M.; to study both cases personally in a private hospital; to have a follow-up study in the pediatrics department of the University of Minnesota and to have post mortem studies in the pathology department and brain examination by Dr. A. B. Baker, Professor of Neurology.

The two cases to be presented offered opportunities for accurate history, observation, and study by many physicians.

Case 1. The first patient, D.B., referred to me by Dr. Paul Kortsch, was seen and studied at St. Barnabas Hospital in March of 1946, at the age of three years and three months. Both parents, of German extraction, were in good health. One other child, a brother, born July 3, 1945, has been well to date, March 14, 1950. The patient, who was the first born, was normal at birth on December 26, 1942, with a weight of 9 pounds 12 ounces; was breast fed for four months; inoculated for diphtheria before his first birthday, and then vaccinated for smallpox. He had been given cod liver oil and had a good diet. Aside from "taking orange juice poorly" and walking late (16 months), he had progressed favorably. About July, 1945, seven or eight months before the first hospital admission at the age of 29 months, he began to have nosebleeds about once a month. The blood would gush for a short time and then stop. Up to the age of three years no infections except "colds" and "one mild sore throat" were reported by the mother. On March 15, 1946, the child was acutely ill with a high fever of 103° to 104° rectally. He was irritable and whiny, and perspired easily. Other manifestations suggested embolic as well as hemorrhagic involvement. These were bleeding of the lips with black crusts, and rash on the inner aspect of the soles and feet, as well as on the pubic and sacral region and the neck, which were described as "macular with few pustules." Obvious tonsillitis, otitis media (right), cervical lymph gland involvement, gingivitis, sinusitis (nasal accessory) were demonstrated. Bacteremia and meningitis were seriously considered.

Previous administration of sulfamerazine and aspirin was stopped. Cultures of the nose and throat, blood cultures and agglutination tests, and smears for Vincent's were negative. Anemia (hemoglobin 60 per cent), leucocytosis 30,000, and minimal urinary findings were found. The spinal fluid showed 26 cells—20 polymorphonuclears and six lymphocytes with negative protein, sugar, and chlorides. Also negative were the Wassermann and culture for tuberculosis and other bacteria. Eye grounds were negative.

On March 19, 1946, a transfusion of 230 cc. of blood was given, but it produced cyanosis and a temperature of 104° rectally, and was discontinued immediately. Adrenalin gave alleviation. The child was group II Rh negative; the mother Rh negative, Rh′ positive, and Rh″ negative.

The next day a second transfusion of 150 cc. was given without incident. Vitamin C, vitamin K, and vitamin B complex were given in abundance during these first few days by subcutaneous administration.

From then on because of complete refusal of fluids or foods orally, 200 cc. of milk and Dietene were given by gavage each four hours for four days. Apparent complete recovery followed the 16 days of subcutaneous administration of penicillin.

X-ray interpretations by roentgenologist Dr. Russell Morse were as follows: The x-rays of the long bones taken on admission were considered negative; the x-rays of the chest were negative except for increased markings (Figure 1); not so the x-rays of the sinuses—to quote: "Subacute or chronic inflammatory process involving the ethmoids and left maxillary. A slight involvement of the right maxillary." These x-rays in the light of future prognosis should have been repeated. Also, convalescent care at this time may have had a profound influence on the child's future.

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*Clinical Associate Professor Pediatrics, University of Minnesota Medical School.

†Since deceased.

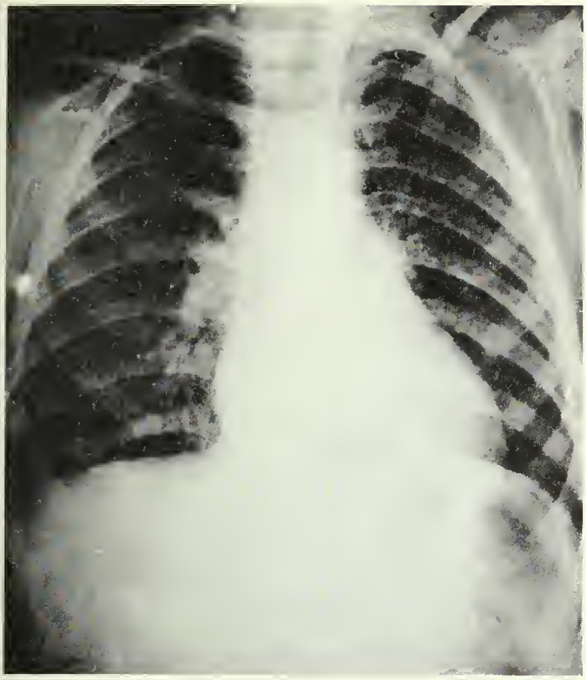


Fig. 1. Case D.B. Six foot chest plate showing no enlargement of the heart.

During his first stay at the hospital the child was exposed to the chickenpox, and developed the disease soon after his discharge.

The second admission was about six months later, on September 10, 1946. In the intervening months, aside from chickenpox, there were several "colds" with no fever, as well as irritability, fatigue, lethargy, and a change in disposition. "Very mean to baby brother," "antagonistic," and "non-cooperative," were some of the descriptive phrases illustrative of this period. This might be considered confirmatory of an encephalitis with the previous illness. Anorexia and then vomiting for three days required hospitalization. On admission the extreme irritability and antagonism made an examination difficult, but again neurological involvement was considered. The spinal fluid showed six cells, one polymorphonuclear, and five lymphocytes. The inoculation of guinea pig for tuberculosis and the culture for other bacteria were negative. A skin test, 1–500 dilution tuberculin, was also negative. The hemoglobin was high, although Dr. Kortsch had found anemia of 56 per cent during the summer, which was two months previous to the second admission. The higher hemoglobin was possibly part of the hypoxia due to heart failure.

The clinical examination and x-ray showed extreme enlargement of cardiac dulness, and cardiac shadow respectively (Figure 2). The heart tones were distant on auscultation, the pulse at the wrist thin—but dorsalis pedis pulsation easily palpable.

On September 21, 1946, the child was transferred to the University Hospital with definite signs of congestive heart failure, enlarged liver, slight pitting edema of the extremities—albuminuria one plus—and oliguria pallor and puffiness of the face.

The blood pressure readings were variable—especially the diastolic varying from 75 to 0; the systolic from 90 to 100. The EKG showed T_1 negative T_2 diphasic with P-R interval of 0.14 seconds and QRS of 0.10 seconds (Figure 3). Two blood sedimentation rates were 1.5 and 2.0 mm. in 60 seconds. The low sedimentation rate with signs of decompensation is regarded by some as a very unfavorable sign.

The University Hospital admission note confirmed the finding of edema of extremities and in addition noted 3 plus edema over the sacral area. The throat and tonsils were mildly injected, pulse was 105, respiration 28, and blood pressure was an indefinite 95/85. There was marked perspiration and grunting respiration on exertion. Through this period there was a mild rise in the temperature.

He was given Digalen, two cc. by hypodermic, twice a day for 24 hours, then two cc. once daily for the succeeding two days. Fluids were restricted to 800 cc. One-half gram of Theocalcin was given three times a day. The child improved, the blood urea nitrogen of 25 mg. per cent at admission decreased to 12 mg. per cent and signs of congestive heart failure decreased. Digalen, one cc. (½ U.S.P. unit) was given for two more days then *one* oral digalen tablet (½ U.S.P. units 50 mg.) continued to the day of discharge, October 10, 1946. The temperature, pulse, and respiration were normal. The weight was 15.6 kilograms, a loss of almost two kilograms. One week later the sedimentation rate was 29 mm. in 80 minutes. So certainly prognosis seemed brighter.

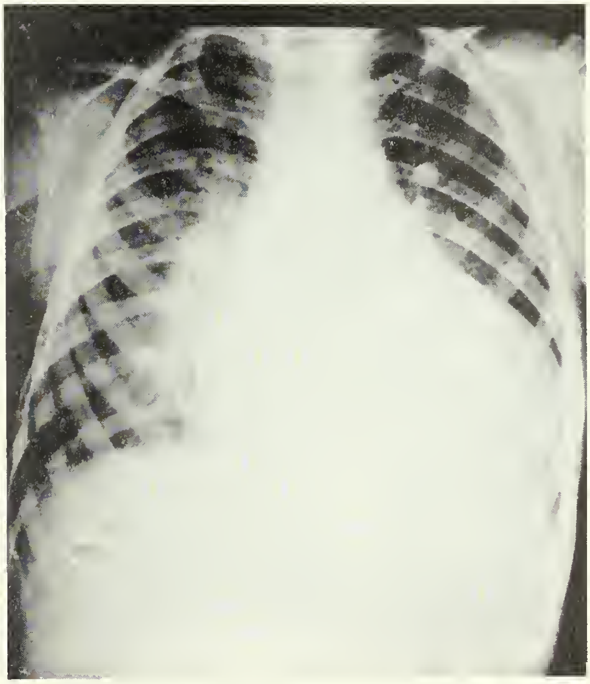


Fig. 2. Case D.B. Six foot chest plate showing marked enlargement of the heart.

The course from then on however was depressing—anorexia, vomiting, irritability, pallor, cough, pulmonary congestion with readmission several times, and interim observation in the outpatient department. No heart murmur was heard until September 18, 1947—"soft systolic in 3rd and 4th left intercostal spaces." The blood pressure was 100/20, liver down five finger breadths and chest showed bilaterally "coarse, slightly moist, râles at this time."

Four weeks later the chart looked fine—temperature, 99.4° (R); pulse, 100; respiration, 20; blood pressure, 108/70—this in spite of a gruesome history of irritability, restlessless, pallor, puffiness of the face, fatiguability, orthopnea and grunting respiration, and repeated episodes of vomiting. The apex of the heart reached to the left midaxillary line.

Twenty-four days before death the optimism of one clinician recorded good response to digitoxine and oxygen tent as indicated by a "definitely improved chest." Six days later the patient was "to go home"—but dyspnea, apathy and profuse sweating necessitated the child be "put back into oxygen."

All of the above were indicative of the inability of all clinicians to recognize the *relentless character of the disease.*

Death occurred November 11, 1947.

Reviewing these 20 months, this child was from the onset, fatigued, irritable, anorexic, pale and puffy about the face, in danger of, or in congestive heart failure. The cardiac enlargement, not found until six months after the first severe illness, may have been present several months before detection. From then on the EKG, the cardiac enlargement, the variable diastolic pressure, the variable sedimentation rate presaged a fatal outcome. The earliest suggested symptom of gushing nosebleeds of short duration were noted eight months before the severe illness. This focused nose, sinus, and throat infection as preceding the serious heart enlargement. It is perhaps a coincidence that chickenpox was contracted after apparent good recovery with first severe illness, but this may be a factor to watch as both cases being reported had chickenpox.

The post mortem interpretations were definite as to an enormously enlarged dilated heart of 330 grams in weight. Microscopically, changes were observed in heart muscles, such as loss of nuclei and striations, with lymphocytic infiltration and fibroblastic proliferation. The involvement was of the endo- and myo-cardium and septa,—even into the Bundle of His but not of the valves and the pericardium. No Aschoff nodules were found. Subacute encephalitis was diagnosed by Dr. A. B. Baker on microscopic examination of the brain.

Etiologically all tests for lues, tuberculosis, toxoplasmosis, equine and St. Louis encephalitis, "2" fever antigen, in addition to spinal fluid and blood cultures, were negative.

Coincident with the first University hospital admission *blood chemistry* showed slightly lowered carbon dioxide combining power (34 vol. per cent), chlorides (642 mg. per cent), and plasma protein (5.7 per cent). The kidneys never showed serious involvement, urea nitrogen and creatinine even being low just before death. Recent work indicative of heart and EKG changes with changes in potassium of the blood might suggest the wisdom of doing other electrolyte studies in heart cases.

The child was tested for allergic asthma, but soon after had a pulmonary congestion, so cardiac asthma may have been present. The family history is negative for hay fever and asthma, but the mother has a mild dermatitis (fungus?) and a maternal aunt has chronic sinusitis.

The behavior of this boy could have been ascribed to actual encephalitis, due, likely, to the same causative agent as the heart involvement. The child was a definite disciplinary problem, and perhaps even somewhat less alert than normal. How easy it is to blame the mother for the lack of rest and cooperation in a child, but how manifestly unjust in this case.

The child was Rh negative, tested when no great variety of sera was available. The mother is Rh negative, Rh′ positive and Rh″ negative.

Treatment was much like that of an adult, although mercurial diuretics like mercurhydrin were not used. They might have been of temporary value.

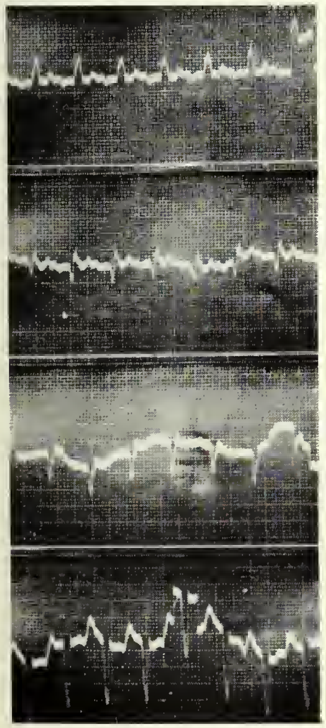
Case 2. D.M. was born May 14, 1941, the third pregnancy. Two children born previously were a brother G. on February 17, 1936, and a sister J. on August 19, 1937. After patient's birth, a sister was born on February 17, 1943. These three, all full term, have been and are well to date except for minor illnesses. The father is group RH_0 pos, Rh′ pos, and Rh″ neg. The mother is group A, Rh_0 pos, Rh′ weakly pos, and Rh″ neg. The child was not grouped. The family history is negative for allergy except for slight hayfever in father and severe hayfever in a paternal aunt. The mother gained an excessive amount of weight during the pregnancy of the patient, whose birth weight was 9 pounds, 3 ounces. Delivery was spontaneous, and the patient was partly breast fed for three months. His diet, cod liver oil, and orange juice were adequate and the child did well in the first year. Inoculation for diphtheria and vaccination for smallpox were done before the age of one year. He was not inoculated for whooping cough. At eight months he had measles, but walked alone and talked at one year.

Following pertussis at 26 months, he was admitted three months later to St. Barnabas Hospital and seen in consultation with Dr. William Foster in October, 1943. He had had a long walk the day before admission and next morning illness with vomiting. He then developed spasms of the calf muscles with extension of the legs and feet, turning in of the toes and tendency to walk on the ball of the feet, if he attempted walking, which he was loathe to do. With the leg involvement was noticed a slight inclination to straightening out the fingers of the right hand. The fact that these phenomena were observed from time to time up to the occurrence of congestive heart failure merit consideration. The vomiting seemed to act as a trigger mechanism and elicit the peculiar spasm of legs and right hand. A cerebral involvement, poliomyelitis, or some blood electrolyte change was suspected when seen at the hospital at 29 months of age. The blood calcium was 10.1 mg. per cent and the urine and eye grounds were negative. No blood pressure or heart studies were done at this time.

Shortly after discharge at 30 months he had so-called "flu" infection with high temperature but a good recovery; at 38 months he had chickenpox. About this time he developed a right hydrocele. At the age of five years he was seen again preliminary to the hydrocele operation on June 18, 1946. The history for about two years had been negative. Examination showed large tonsils though not inflamed, with cheesy plug on one side and a moderate anterior and posterior cervical adenopathy. The blood pressure was 108/86; hemoglobin, 88 per cent; white blood count, 6050. The urine contained a trace of albumen and from 5 to 8 red blood cells in a high-power field. While at the hospital the mother observed postoperatively a mild attack of stiffening of feet and right hand, similar to that described above.

A few weeks after discharge the child developed nausea and vomiting and fever. After these symptoms subsided he became jaundiced so he was given bed rest for a few days longer before returning to school. He again showed the stiffening of the feet and of the right hand, but it was very transient and because of reassurance at the hospital it was not given further consideration.

To summarize we have: a normal development during the first year in spite of measles at eight months of age; at 26 months, pertussis followed by the syndrome of leg spasms and slight right hand involvement; at 30 months, "flu" infection; and at 38 months, chickenpox. Between two-and-a-half and three-and-a-half years a hydrocele developed on right side and at five years there was surgery for this condition. Preoperative examination indicated *throat involvement,* but no acute inflammation. Urine showed minor changes, but blood pressure showed high diastolic pressure. Postoperatively there was mild stiffening of legs and right hand. After discharge from the hospital there was infection followed by jaundice in July, 1946.



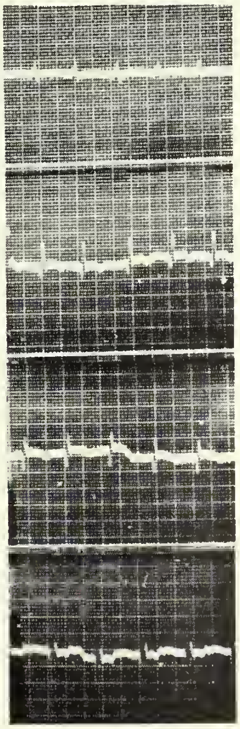


Fig. 3 (left) Case D. B. Electrocardiogram at time of congestive heart failure. Reading down: Leads 1, 2, 3 and 4.
Fig. 4 (right) Case D. M. Electrocardiogram at time of congestive heart failure. Reading down: Leads 1, 2, 3 and 4.

These were the events preceding the serious illness which began a few days after his seventh birthday on May 14, 1948, although he had been well for 22 months. On June 10, 1948, he was admitted to St. Barnabas Hospital. His illness had begun with a cough,—paroxysmal at times for about four days, then a tired feeling which became marked. About five days before admission he had loss of appetite, vomiting, and then again this peculiar spasm of the right hand and both legs, puffiness and pallor of the face, abdominal pain and grunting respiration. No history of aches or pains or epistaxis. He was admitted with all the signs of congestive heart failure—moderate or slight temperature, fast pulse (150), blood pressure 106/88, tick-tock rhythm of the heart, and enlarged heart. The ears, nose and throat were considered negative.

There was a discussion as to whether he had pneumonitis or pulmonary edema both clinically and by x-ray. There was dulness and diminished breath sounds in both bases, especially on the right. He was given a low salt diet; fluids limited to 1500; penicillin 100,000 every six hours; digitoxin 0.2 mg. by hypodermic every eight hours for three days, then changed to 0.1 mg. and 0.05 mg. a day. Oxygen was given for seven days in a tent. The pulse came down in three days to 120 and then 110—not a remarkable change. Blood pressure was variable, with the highest systolic pressure 132, the highest diastolic pressure 70. The lowest systolic pressure was 78, and the lowest diastolic pressure was 50. Two blood cultures taken before therapy were negative. The carbon dioxide combining power was 56 vol. per cent. The total blood proteins were low—5.3 per cent, with albumin 2.8 and globulin 2.5. Plasma chlorides were 560. Hemoglobin was 90 per cent and white blood cell count 20,900 with 70 per cent polymorphonuclears. Urine was negative except for minimal findings. There was a very slight trace of albumen, with few hyaline casts and white blood cells in centrifuged specimen. It was negative for bile and urobilin but three plus for urobilinogen. On June 14th, white blood cell count was 8,150; hemoglobin, 95 per cent; polymorphonuclears, 66 per cent; lymphocytes, 30 per cent; monocytes, three per cent; and eosinophiles, one. On June 23rd, the total blood protein was 5.9 per cent; albumen, 3.7; and globulin, 2.2. The sedimentation rate was 23 mm. in one hour.

The EKG showed T waves (Figure 4) described as low, isolectric, or negative in leads I and II and negative in lead III. The p_1 waves also were conspicuous by their difficulty of visualization. Considering this handicap, the three EKGs on June 10, June 11, and July 1 revealed a P.R interval of 0.15, 0.16, and 0.20. The QRS complex was .06, .06, and .09 and this was definite. All in all this would certainly speak for myocardial injury.

On June 30th the child was discharged. He had received 100,000 penicillin units four times a day, from June 10th to June 26th, and then crysticillin 150,000 three times a day. He was on 0.05 mg. digitoxine (oral). The day following discharge at noon after taking the digitoxine he became disoriented, had a convulsion and was readmitted, in a comatose state with right hemiplegia. The next day he had drooping of the right corner of the mouth and loss of speech. Heart and lungs were negative on examination yet it was felt that the hemiplegia was due to an embolus from the heart. Blood culture again was negative. X-ray of the heart a week after admission showed enlargement with total transverse dia 61 per cent of internal thoracic dia; three weeks later this percentage was 55 per cent. X-rays of the skull and sella turcica were negative on July 6, 1948.

Eye grounds were negative on August 1, 1948. On August 4th "barium swallow" showed posterior displacement of the esophagus, therefore enlarged left auricle with no evidence of hilar dance or increased hilum vascular shadows.

It was decided to continue 300,000 penicillin daily "by hypo" at home because of possibility of subacute bacterial endocarditis with emboli. The hemoglobin, however, continued high—90 to 100 per cent—during this period. On August 5th the patient was discharged.

Seventeen days later the child developed a fever and vomited all day, a condition which continued during the next week. On August 25 the urine was negative. He was admitted to the University Hospital on August 28, 1948 with anorexia and oliguria. The findings remained definite but not appearing too definite when you enumerate: temperature, 100.8° (r); pulse, 124; respiration, 24. There was slightly enlarged liver; spleen not palpable, heart tones weak and distant (no murmurs); x-ray, diffusely enlarged heart and some pulmonary congestion. Hemoglobin, white blood cell count and differential, urine, and blood urea were normal. Low voltage EKG on August 30, 1948, P-R interval was 0.16 with .04 QRS. There was right axis deviation.

Digitoxin was given in 0.1, 0.3, 0.2, 0.1 mg. doses on successive days until September 8, when prolonged P-R intervals (0.24) were interpreted as over digitalization. Digitalis was discontinued September 9th. There was severe orthopnea, and the liver was much larger. Oxygen tent gave some relief, but he died September 11, 1948.

Strange how inconclusive were many of the laboratory tests at the University Hospital: blood and urine were negative; fasting blood sugar, 0.81 mg. per cent; blood culture, negative; and blood urea nitrogen 9 mg. per cent. Blood calcium was 8.6 mg. per cent and blood phosphorus 4.7 mg. per cent. Plasma proteins were 6.3 per cent; Kline test for lues negative.

One cannot but be impressed that the heart muscle could beat and give such a good circulation and normalcy of body fluids up to such a short time before death. If one does not find obvious myocardial changes, the idea of some other mechanism besides infection causing death should be entertained.

The post mortem revealed encephalomalacia due to the occlusion of left middle cerebral artery, thus accounting for the hemiplegia on the right side, as well as the speech loss. The boy was right-handed. The heart and liver were enlarged and some edema was shown through the organs. The heart weight was 210 grams. Ductus arteriosus admitted a probe—significance questionable. Microscopically the myocardium showed few round cells scattered throughout. There was a fresh and old thrombus of left auricular appendage with fibrin and platelets and infiltrating capillaries and fibroblasts in the latter.

How embarrassing after all the diagnoses of endocarditis, pericarditis, subacute bacterial endocarditis, rheumatic fever heart. The inability to demonstrate myocardial change in microscopic section may be a matter of length of involvement. As to etiology—whether myocardial involvement can be latent two or three years after contagious and infectious disease is an unanswered question, or may one postulate that measles, whooping cough, tetany or claudecation of arteries of the arms, legs, and brain, "flu", chickenpox, an operation, catarrhal jaundice, and pneumonitis may over a period destroy contractile quality of heart muscle without remarkable pathological findings? Was the last illness only an exacerbation of a latent infection, or could we postulate that the peculiar muscle spasm was part of electrolyte change such as the potassium deficiency described by Wallace and Moll in *Pediatrics*, September, 1949, with the heart muscle also affected? In the future more blood chemistry is indicated. Should we consider the likelihood of blood vessel changes in brain, legs, and heart? Or did we have an abnormality of the left middle cerebral artery—like a congenital aneurysm—aggravated by pertussis and developing occlusion from a clot of the left auricular appendage. There certainly were evidences of myocardial involvement with congestive heart failure probably a necessity for clots to form in the auricular appendage.

Summary

Two cases are presented with evidence of *myocardial involvement* and congestive heart failure. Neither had murmurs until late nor joint involvement.

The first child had encephalitis and extensive myocardial change, demonstrable pathologically on microscopic section.

The second child had congestive heart failure and hemiplegia—without recognizable myocardial involvement on microscopic section.

Poliomyelitis

*An Outbreak in North Dakota in 1949**

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Ninety-four children with poliomyelitis were seen during 1949. Although several children with this disease came under our care during the winter months, it was not until early June that a significant number of cases occurred. The increased incidence of cases in June, even though chiefly non-paralytic in type, led us to predict another epidemic year for poliomyelitis in this area. Table I outlines the monthly incidence of the disease in 1949 and compares it to 1946, the last epidemic year, as reported previously by one of us.[1] It may be seen that the greatest incidence in 1949 was during August with a sharp drop during September beginning during the second week. This was in contrast to 1946 when the drop did not occur until October. Our 1949 series represents slightly more than one-half of the cases cared for locally during the outbreak. About 40 per cent of the children were from Fargo and Moorhead while the remainder were from neighboring communities and rural areas.

The number of paralytic cases was smaller in 1949 than in 1946 (Table I). However, there were two deaths in 1949 in children with fulminating bulbar symptoms whereas in 1946 no deaths occurred. It should be emphasized that the non-paralytic cases were identical with paralytic cases in symptoms and course of disease except that paralysis did not develop. For every child on whom a diagnosis of poliomyelitis was made there were at least five in which the disease was suspected but in whom the typical physical findings did not develop.

Table I
The Monthly Incidence of Poliomyelitis

	Nonparalytic		Paralytic		Total	
	1946	1949	1946	1949	1946	1949
January	—	2	—	—	—	2
February	—	—	—	1	—	1
March	—	—	—	—	—	—
April	—	—	—	—	—	—
May	—	1	—	—	—	1
June	—	8	—	1	—	9
July	5	9	3	2	8	11
August	15	35	14	10	29	45
September	19	15	12	5	31	20
October	2	1	6	2	8	3
November	—	1	1	—	1	1
December	—	—	3	1	3	1
Total	41	72	39	22	80	94

The age incidence was somewhat different in the two outbreaks, tending to affect a slightly older age group in 1949 (Table II). The greatest incidence in 1949 was in the six to thirteen year group whereas in 1946 it was more in the two to six year group. Also, there was only one child under two years of age in 1949 as compared to seven in 1946. This shift away from the infantile age group has been noted in recent years by observers throughout the world[2] but its significance is not known with certainty. There was no statistical difference in the amount of paralysis in the different age groups.

Table II
Age Incidence of Poliomyelitis

	1946	1949
Under 2 years	7	1
2 to 6 years	31	33
6 to 13 years	28	50
13 to 16 years	14	10
Total	80	94

In the 1946 outbreak there was a contact (known or possible) in 37 per cent of children with a case of poliomyelitis within a two or three week period before the onset of illness. In 1949 the situation was approximately the same. In the urban areas it was noteworthy how often cases tended to localize in certain blocks or neighborhoods; in several families multiple cases occurred. In rural sections certain areas were heavily hit and in some instances children from neighboring farms contracted the disease. In September a child from a nearby town was brought in with paralysis on one leg and other typical signs and symptoms of poliomyelitis of a week's duration. When asked if there were any other cases of poliomyelitis in their town the mother said no but that almost everyone in town had had the "flu" during the past month and that her child had become ill with the same symptoms of "flu". The symptoms consisted chiefly of fever, headache, and vomiting. It seems likely that many cases of non-paralytic poliomyelitis were present in that community without being recognized as such.

The early symptoms of poliomyelitis are usually headache, fever, nausea, vomiting, and pain and stiffness in the neck and back. Headache was a presenting complaint in 70 of our patients, fever in 43 patients, nausea and vomiting in 39 patients, and pain and stiffness in neck or back in 27 patients. Several children complained of sore throat. Coarse tremors occurred in a few children and were considered an important diagnostic sign.

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Combinations of the aforementioned symptoms often occurred. The early symptoms were identical in the paralytic and the non-paralytic cases.

In approximately one-fourth of our cases the typical symptoms of poliomyelitis were preceded by a non-specific illness three to seven days before, consisting of moderate fever, general malaise, and sometimes mild headache and/or vomiting. A sore throat and moderate pharyngitis were present in several children. These symptoms were not accompanied by any signs referable to the central nervous system. In all but one instance they disappeared temporarily after about two days. In that case, in a child six years old, a week of fever, pharyngitis, cough, and nosebleeds merged into typical bulbar poliomyelitis of a severe type.

The physical findings in poliomyelitis are usually characteristic of the disease. A positive back or neck sign was elicited in every child in the 1949 outbreak. With the child lying on his back the examiner's hand is placed in back of the child's head; the child is told to raise his head and look at his feet while at the same time gentle pressure is exerted to flex the neck and back. In a majority of patients attempted flexion of the neck and back is painful and difficult. In the remainder the child is placed in a sitting position with the legs extended straight before him on the table; when this is done it is usually impossible to sit upright and he assumes the tripod position with the hands and arms bracing him from behind. In a small percentage of children it is necessary to flex the neck while in the sitting position to elicit the sign; on flexion of the neck there is pain and a pulling sensation in the lumbar region and sometimes also in the dorsal region. This sign often becomes more definite and pronounced during the first few days of illness. A positive Kernig sign is usually but not always present. Muscular hyperesthesia or weakness is not often present at the onset of that disease. The sensorium is clear in all children although a few are drowsy and apathetic. Coarse tremors when present are a significant diagnostic sign. The typical signs and symptoms are not always present in the infant and young child. In the 1946 outbreak in which there were seven children under two years of age the diagnosis would not have been made in two of them had not a slight limp developed.

The body temperature is most often between 100° F. and 102° F. rectally during the first few days of illness but may be as high as 104° F. or as low as 99° F. The temperature tends to be highest in the bulbar cases during the acute stage of illness; this was our experience. The temperature ordinarily drops to a normal value within three days; in extremely toxic cases with progressive paralysis it may remain elevated for a week or longer. The onset of paralysis usually occurs within two or three days of illness but may be deferred as long as a week. It is uncommon for paralysis to develop after the temperature has been normal for 24 hours although we have seen paralysis develop in an unaffected extremity more than two weeks after the acute phase of illness was past.

The white blood cell count is not elevated in uncomplicated poliomyelitis. In 65 out of 92 patients who had blood counts during the early stage of illness the white blood cell count was under 10,000 cells per cubic millimeter. There were no white blood cell counts over 20,000 cells per cubic millimeter. The blood sedimentation rate is normal.

Examination of the spinal fluid was carried out in all patients during the acute phase of their disease (Table III). Comparison is made with the findings in the 1946 outbreak when spinal fluid examinations were made in 64 out of 80 patients. One may see that in 1949 the spinal fluid cell counts were 10 per cubic millimeter or less in 37 children and more than that in 57 children; this is almost the same relationship that existed in 1946. Forty-five per cent of non-paralytic cases in 1949 had counts of 10 per cubic millimeter or less; 14 per cent of spinal paralytic cases and 25 per cent of bulbar cases had counts of 10 per cubic millimeter or less. The spinal fluid total protein was determined in 90 cases; it was under 40 milligrams per cent in 67 children and over 40 milligrams in 23 children. Spinal puncture was repeated in several cases after a few days in patients with normal cell counts; no significant changes occurred in cell counts or protein.

TABLE III

Spinal Fluid Cell Count in Relation to Type of Involvement

Cell Count	Non-paralytic 1946	Non-paralytic 1949	Paralytic Spinal 1946	Paralytic Spinal 1949	Bulbar or Bulbospinal 1946	Bulbar or Bulbospinal 1949	Total 1946	Total 1949
0 to 10	19	33	4	2	—	2	23	37
11 to 20	—	9	1	2	—	—	1	11
21 to 100	10	25	6	5	4	5	20	35
101 to 900	9	5	9	4	2	1	20	10
901 and over	—	—	—	1	—	—	—	1
Total	38	72	20	14	6	8	64	94

The relationship of recent tonsillectomy to the development of bulbar poliomyelitis has been recognized for a number of years.[3,4,5,6] One of our cases, that of a child six years old, had a tonsillectomy during the early part of June and developed symptoms and signs of mild bulbar poliomyelitis with pharyngeal weakness a week later with complete recovery. There were no other cases of tonsillectomy within 60 days of onset of poliomyelitis. Over 50 per cent of the children with poliomyelitis still had their tonsils and so no relationship can be seen between the presence or absence of tonsils as such. All tonsillectomies were cancelled on June 15, 1949, and were not resumed until after the subsidence of the outbreak; the last week in October was when we considered it safe to recommend routine tonsillectomies again. This corresponds to our policy in previous years.

Other preventive measures were instituted after the outbreak gained headway. Newspaper publicity warned against gathering in crowds, especially for children, and advised concerning measures to promote general health and resistance against infection. The public swimming pool was closed. The opening of public grade schools and high school was delayed until the outbreak showed evidence of subsiding.

Treatment during the acute febrile phase of illness was directed toward the hydration and general well-being of the patient. Hot packing according to a modified Kenny technique was used routinely; as a rule this was not begun until some of the general toxicity began to subside. This packing was carried out by nurses under the supervision of a pediatrician and a physiotherapist and was continued until all muscle soreness and tightness was gone. The physiotherapist also carried out passive and active motion and a program of muscle re-education. When paralysis was severe or interfered with locomotion an orthopedist was called in consultation. Two children required braces for the lower extremities after treatment for several months, and two others required airplane-splints of an upper extremity for part-time use to prevent subluxation of the shoulder joint. No contractures developed and no surgical procedures have been needed on any patients—at least as yet.

There were two fatalities in 1949 in children with fulminating bulbar poliomyelitis. Both required tracheotomy because of inability to clear secretions from the pharynx with postural drainage and suction. Both had encephalitic symptoms and probable involvement of the respiratory and circulatory centers. A third child who required tracheotomy made a complete recovery. Five children required a respirator; one of them a little boy four and one-half years old with intercostal and diaphragmatic weakness entered the iron lung in August, 1949, and is still there on March 1, 1950. He can now stay out of the respirator for one-half hour at a time several times daily. It is hoped that the rocking bed,[7] designed to raise and lower the diaphragm, will help to free him from the need of the iron lung. There is an element of fear and dependence on the respirator but there is also still definite weakness of the diaphragm and to a lesser extent of the intercostal muscles. It is possible that the oscillating bed, first used by Wright in 1944, will give him enough assistance in breathing so that he will lose his dependence on the respirator. This bed is now enroute. A chest respirator, tried several months ago, did not prove effective. This child also has extensive involvement of the extremities and trunk; for a time he had true bulbar signs with inability to swallow and clear secretions from his throat. Intravenous fluids were utilized then and the respirator tipped so that the head was 30 degrees lower than the feet. Suction and oxygen were used when indicated. Needless to say, special nurses have been with him night and day ever since the onset of high cord and bulbar involvement.

Tube feedings can be used in patients with inability to swallow after the acute stage of illness is over. A seven year old boy with a tracheotomy learned to put the tube down his own throat; he was taught this cautiously and received a good deal of praise for his accomplishment. An especially nutritious mixture was given by the gavage tube[8] which enabled him to maintain his nutrition until his swallowing mechanism recovered its function.

Drugs were not used to any extent. There have been conflicting reports on the use of curare[9,10] and we did not feel justified in using it. We have never been impressed with the value of prostigmine[11] although we used it in an occasional patient. Myanesin[12] may be worthy of trial but not enough information on it was available to consider its use. Sedatives are contraindicated in bulbar poliomyelitis. Penicillin and at times streptomycin were used in bulbar patients to prevent and treat secondary lung infections. Intravenous 10 per cent glucose was given in acutely ill children with bulbar poliomyelitis. We felt that it was helpful, but the rate of flow and total amount has to be carefully regulated to prevent pulmonary or cerebral edema. Urinary retention occurred in several children and was relieved in each case by the subcutaneous administration of a parasympatheticomimetic drug called furmethide as recommended by Lawson.[13] Oxygen was administered to children with inadequate air exchange by means of nasal tube, cone or tent. We do not recommend the oxygen tent as one cannot watch the condition of the child closely enough. Digitalis was administered to one child with bulbar poliomyelitis with symptoms and electrocardiographic evidence of myocarditis; this was done in view of reports of myocarditis in a high per cent of fatal cases.[14] Other cardiac and respiratory stimulants were used at times in the hope of obtaining temporary benefit. Atropine is contraindicated, as it tends to make secretions more viscid and tenacious.

DISCUSSION

Diagnosis:

Poliomyelitis may be divided into four stages.[15,16] The *first stage* is the prodromal stage which occurs in 25 to 35 per cent of patients. This consists of a nonspecific febrile illness lasting for two or three days. This may or may not be followed in about four days by the *second stage* or preparalytic stage in which the virus invades the nervous system. This is the time when the typical symptoms and signs of poliomyelitis appear. This stage usually lasts for from three to six days. The *third stage* is the paralytic stage and may or may not appear. It occurs usually two or three days after the onset of the second stage but may be delayed for as long as a week. The paralysis may be spinal, bulbar, or both. The *fourth stage* is the post-febrile period characterized by muscle tenderness and spasm, fatigue, and sometimes other related symptoms. This stage occurs in the nonparalytic as well as the paralytic patients, and may last for several weeks. In fact, fatigue even in nonparalytic patients may last for several months; the muscle tenderness and spasm in the back and hamstring muscles usually subsides much sooner than that, within two to three weeks as a rule.

There is seldom any doubt concerning the diagnosis of poliomyelitis in the paralytic spinal or bulbar case. However, the diagnosis of the disease in its abortive or nonparalytic form is more difficult. In the abortive type without invasion of the nervous system the typical physical findings do not appear and the child is well after two or three days. In such cases the diagnosis cannot be made except by isolation of the virus from the throat or stools, a long and expensive procedure only possible for the epidemiologist or research worker. In the nonparalytic form of poliomyelitis a diagnosis should be possible by the practicing physician as in this type the disease goes into stage two with the usual symptoms of severe headache, nausea, and vomiting together with a positive back or neck sign. The disease then skips the paralytic stage but often goes on to the fourth stage. In such cases it has been customary to rely on positive spinal fluid findings to establish the diagnosis, these findings consisting of elevated cell count and protein with normal sugar and chlorides. Many workers in this field[17,18,19,20,21,22] have observed a definite percentage of cases of both paralytic and nonparalytic poliomyelitis in which the cell counts (and often protein values) have been normal, ranging from 7 per cent to over 50 per cent. It has been reported[23] that serial determinations of spinal fluid protein values are helpful in diagnosis of doubtful cases as they tend to rise during the second and third weeks and then gradually fall.

We have always been cautious in diagnosing poliomyelitis in the presence of normal spinal fluid findings. However, if the history and physical findings are typical of the disease and a 24 to 48 hour period of observation shows no other cause for complaints, we feel that such a diagnosis is justified and necessary.

In spite of the frequent negative evidence supplied, it is felt that spinal puncture should be done whenever possible in the early stages of poliomyelitis. It is a harmless procedure when done with proper precautions.[24] It is valuable as a diagnostic procedure when positive and may also help to relieve increased fluid pressure and headache to some extent. As an example of its value, a two year old child who was sent in during the 1946 outbreak as a possible case of poliomyelitis proved to have fluid changes characteristic of meningococcus meningitis and responded promptly to specific treatment.

Differential Diagnosis:

In diagnosing poliomyelitis one must consider and rule out the encephalitides, meningitis, lymphocytic choriomeningitis, Guillain-Barre syndrome, tick paralysis, tetanus, botulism, and brain tumor. Even pneumonia must at times be ruled out by x-ray examination of the chest as it is a fairly common cause of meningismus. One can usually differentiate encephalitis from poliomyelitis on the basis of severity and nature of symptoms and signs but this is not always true. In doubtful cases frozen serum from the patient should be sent to one of several laboratories throughout the country equipped to do complement fixation and neutralization tests for eastern and western equine encephalitis, St. Louis, Japanese B, mumps encephalitis, and other viral diseases such as lymphocytic choriomeningitis and Newcastle disease. Samples should be obtained on the third and tenth days of disease and then again two or three weeks later.[25] Unfortunately, these studies are time consuming and of no help during the acute illness. No such tests are as yet available for poliomyelitis itself and therefore one must exclude other possible diseases and arrive at the laboratory diagnosis by that means. Spinal fluid examination does not give help in ruling out encephalitis as the findings are the same but, of course, differentiate this group of diseases from meningitis.

An illustration of the difficulty of diagnosis of poliomyelitis and differentiating it from encephalitis in the young infant occurred during the 1946 outbreak. A six month old baby with typical symptoms, signs, and spinal fluid findings of poliomyelitis developed slight weakness in the left shoulder girdle after several days in the hospital. When seen in the office two months after discharge this weakness appeared slightly spastic and included the arm and hand. One year later slight spastic changes were evident in the left leg. After three years she shows a definite spastic hemiplegia and mental retardation. It seems evident now that her disease was encephalitis although her initial signs and symptoms were mild and more characteristic of poliomyelitis than encephalitis. Another child, two years of age, seen in consultation during 1949, had been treated for about two weeks. When seen he had definite nuchal and back rigidity and positive Kernig signs together with spinal fluid changes compatible with poliomyelitis consisting of increased cell count and protein. After a peroid of observation it was obvious that he did not have poliomyelitis but the diagnosis of brain tumor was not made until autopsy was performed.

Guillain-Barre syndrome or myeloradiculoneuronitis is a paralytic disease similar to poliomyelitis but said to be more symmetrical in distribution. The spinal fluid changes usually consist of a normal cell count with high protein values over 100 milligrams per cent. The prognosis has been said to be better for complete recovery than in poliomyelitis although fatal cases are occurring with increasing frequency. There is a suspicion that some cases diagnosed as Guillain-Barre syndrome are actually poliomyelitis. We have encountered no cases of this syndrome.

A poliomyelitis-like disease due to a virus pathogenic for suckling mice and hamsters but not for rhesus monkeys was identified during an outbreak along the eastern seaboard by Dalldorf and his associates in 1947.[26,27] More cases were found during 1948 and 1949 intermingled with cases of classical poliomyelitis. The disease is identical with poliomyelitis as to symptoms, signs, and spinal fluid findings, although it is said to carry a somewhat better prognosis. It is possible that it will be considered a variant type of poliomyelitis. At present, Dalldorf avoids any conclusive terminology calling the virus the Coxsackie virus, named after the town in New York State where it was first discovered. Up to the present time this virus has not been found in the middle west or northwest part of the country.

Prevention:

There is some difference of opinion as to how far a community should go in instituting preventive measures during an epidemic. However, it is agreed by most authorities[17,28,29] that poliomyelitis is a highly infectious disease in which abortive cases far outnumber clinical cases. Susceptibility is greatest in childhood. Multiple cases in families and neighborhoods are the rule and indicate spread by way of the respiratory tract. The virus can be found in the respiratory tract during the first three to seven days of illness[17,30,31] and many people have such slight symptoms that they continue their regular routine. If this is true, there can be no doubt of the advisability of closing swimming pools, delaying the opening of schools, and advising against attendance of children at churches, Sunday schools, fairs, and circuses.[32] It is argued that keeping of schools closed has not resulted in a decreased incidence of poliomyelitis in communities where it has been done,[33] and it is true that closing of schools alone will not halt the spread of the disease. Unless parents can keep their children off the streets and out of crowds any possible benefit from the closure of schools will be lost. Wise and forceful publicity from the local health department and newspapers can make this clear to everyone.

The question always arises as to the role of flies and other insects in spread of poliomyelitis. The virus can be isolated from sewage[34] and often from stools of patients several months after recovery; it has also been found in flies.[35,36] Mosquitoes have not been shown to carry the virus. It does not seem likely that insects play any considerable role in spread of poliomyelitis. Spraying of a community with DDT may be done as a general health measure but not as a direct means of controlling poliomyelitis. All other measures to reduce the population of flies and insects are considered advisable.

It has been emphasized that any child with a fever during an epidemic should be put to bed[37] even though not acutely ill, and kept there until the temperature has been normal for 24 hours. For the three weeks following he should avoid excessive activity and chilling which might lower resistance. The reason for this precaution is that numerous studies have shown[37] that poliomyelitis is statistically more severe in people who engage in strenuous or moderately strenuous activity after the appearance of the initial mild symptoms.

The patient with poliomyelitis should be isolated for a week or until the temperature is normal if that takes more than a week. This is a shorter isolation period than has previously been recommended by health authorities, but seems reasonable as danger from respiratory spread has disappeared by the end of a week. Excretion of virus from the bowel will continue in all probability for several months; no special precautions are advised regarding the stools except ordinary cleanliness.[33] The close contacts and siblings of a patient, especially children, should be isolated for two weeks as the incubation period is usually seven to fourteen days. They should also avoid fatigue and chilling during that time.

As already mentioned, tonsillectomies should be avoided during an epidemic.

No vaccine for human use has been developed as yet. Convalescent serum or gamma globulin have not been shown to be effective in prophylaxis.

Treatment:

Almost all deaths from poliomyelitis occur in patients with bulbar or respiratory involvement. For this reason a further discussion of therapy of these forms of the disease is thought advisable. A respirator will successfully combat respiratory paralysis due to high spinal cord involvement. A fatal outcome in bulbar poliomyelitis is usually due to anoxia resulting from accumulation of secretions in the pharynx and aspiration into the lungs because of inability to swallow or cough. A smaller percentage of patients die as a result of direct involvement of the cardiac or respiratory center in the medulla.

In order to prevent anoxia postural drainage is effective providing the head is below the level of the feet at an angle of at least 30 degrees. This amount of angulation is necessary because the angle of the trachea with the patient supine is 20 degrees downward toward the chest. One must overcome this angle plus another 10 or 15 degrees to allow for drainage from the trachea into the throat.[38,39] A child may often be placed in the prone position with the face turned to one side in which case the foot of the bed does not need to be as high as when he is lying on his back. Suction and constant attention by a competent nurse are essential. Wilson[40] prefers a mechanical suction apparatus with a metal tip so that it can be directed just behind the base of the tongue and above the epiglottis; he warns against the danger of trauma if used by untrained personnel. Galloway[38] prefers continuous water suction with a rubber catheter placed in the cheek or pharynx where secretions tend to accumulate. He uses a collecting bottle and a valve to prevent backflow.

If the patient tends to become anoxic in spite of these measures, tracheotomy must be considered. Galloway and Seifert[38] give the following indications for tracheotomy: (1) Progressive anoxia with secretion in the upper airway. (2) Unconsciousness or pronounced restlessness in a patient who does not respond to other treatment in a few minutes. (3) Pronounced restlessness or stupor in a patient in a respirator even if the paralysis is apparently of a spinal type. (4) Fluid accumulation not otherwise certainly taken care of in a patient who requires a respirator. (5) Bilateral paralysis or spasm of vocal cords. (6) Rapidly progressive bulbar symptoms. (7) Grave signs of vasomotor failure. (8) Untrained or inefficient attendants, inadequate equipment or poor cooperation of the patient with doubt that the airway will be kept constantly free of secretions.

Galloway and Seifert report thirteen tracheotomies in patients with bulbar poliomyelitis without any deaths. They emphasize that the procedure should always be done over a bronchoscope and should be done relatively high through the second and third tracheal rings. They recommend postoperative mechanical humidification without steam and irrigation through the tube at intervals with one to two drops of 3 per cent warmed sodium bicarbonate solution followed by isotonic sodium chloride solution aspirated gently by a beveled rubber tube. They have had little difficulty with bronchial plugging. At the University of Minnesota where a much larger series of tracheotomies have been done Priest[41] reports 29 recoveries in 75 tracheotomized patients, a much less striking percentage of recoveries than reported by Galloway and Seifert. There is a wide difference of opinion as to the danger of tracheotomy itself. We feel that the procedure was life-saving in one of our patients and that in the two who expired death was inevitable had they not been tracheotomized. One child expired during tracheotomy done without a bronchoscope in the trachea; we feel that the fatal outcome might have at least been postponed had the airway been kept open with a bronchoscope during the procedure.

The respirator is often a valuable aid to treatment of the bulbar poliomyelitis patient providing tracheotomy has been performed so that pharyngeal secretions will not be sucked into the lungs. The respirator can be tipped to allow postural drainage. A special wire retractor is used to hold the collar down out of the way of the tracheotomy tube. This was done with good success in one of our patients.

As previously mentioned, fluids should be given intravenously until slight return of pharyngeal function occurs. We have been impressed with the good effect of 10 per cent glucose in carefully regulated amounts. Protein hydrolysates and intravenous vitamins are given daily to maintain nutrition. Small blood transfusions are occasionally indicated. After the child begins swallowing attempts, gavage feedings may be used, cautiously at first, until one is sure that vomiting and aspiration will not result.

Oxygen is needed in patients with anoxia. A nasal tube is often well tolerated, and if so, is to be preferred to a mask, cone, or tent.[38] Lawson[42] has used a positive pressure mask with 100 per cent oxygen for ten or fifteen minutes every two hours with good results in patients with hypoxia and incipient pulmonary edema. After tracheotomy, if oxygen is required, a special cannula can be attached to the tracheotomy tube as devised at the University of Minnesota.[43] It is to be hoped that a clear airway with tracheotomy will make this unnecessary. We have had no experience with this device which includes provision for proper humidification as well as removal of carbon dioxide from expired air.

Authorities agree[11] that hospital care of all poliomyelitis patients is indicated once invasion of the nervous system has occurred, in other words, when the preparalytic stage two is in evidence. Waiting for the onset of paralysis may be too late if the case is to be a bulbar one. Observation can be closer and more complete bed rest and better isolation are often possible. Ordinary isolation precautions in a general hospital give satisfactory protection to other patients in the hospital.[14] We were fortunate in having the complete cooperation of the authorities of St. Luke's Hospital who turned over the entire first floor of the Hospital for poliomyelitis patients for as long a time as needed.

SUMMARY

A resume of the cases of 94 children with poliomyelitis in 1949 is presented and compared in some respects with a similar series of 80 cases in 1946. In 1949 three-fourths of the cases were nonparalytic while in 1946 slightly over 50 per cent were not paralytic; we think that this represents a favorable trend which should be a source of encouragement to all concerned. In addition to the paralytic and nonparalytic cases we saw at least five times as many children in whom signs of invasion of the nervous system did not occur and in whom no definite diagnosis could be made. There were two deaths in 1949 in children with fulminating bulbar poliomyelitis; there were no deaths in the 1946 group of patients. The age trend was toward a slightly older age group in 1949; there was only one child in 1949 under two years of age while in 1946 there were seven; the relative incidence in 1949 was more toward the six to thirteen year age group than in the two to six year group as it had been in 1946. The spinal fluid studies showed that 45 per cent of nonparalytic cases, 14 per cent of paralytic spinal, and 25 per cent of bulbar cases had cell counts of 10 per cubic millimeter or less in 1949. This is approximately the same relationship that existed in 1946. Spinal fluid protein values were under 40 milligrams per cent in 74 per cent of cases and over 40 milligrams in 26 per cent, also a similar relationship to 1946. The outbreak attained its peak in August in 1949, subsiding sharply during the second week in September; in 1946 more cases were seen during September than during August with a drop in October.

Precautions against spread of the virus are considered advisable as epidemiological studies reported in the literature show that the virus of poliomyelitis is harbored in the throat as well as in the intestinal tract; spread of the disease is characteristic of air-borne infections with abortive cases far outnumbering the clinical paralytic and nonparalytic cases. These precautions in the presence of an epidemic consist of closing swimming or wading pools, delaying the opening of schools, and advising against attendance of children at churches, theaters, fairs, and circuses. It should be emphasized that closing of schools alone will not halt the spread of the disease; unless parents keep their children off the streets and out of crowds any possible benefit from closure of schools will be lost. Wise and forceful publicity from the local health department and newspapers can render invaluable aid in instituting proper precautions.

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1949 — A GOOD YEAR FOR BABIES

More children were born in the United States in 1949 than in any year except 1947. The estimated number of registered live births for 1949, 3,581,000, exceeded the 1948 total of 3,535,068 by slightly more than one per cent, but was about three per cent below the number recorded for 1947, the all-time high year.

Hematocolpos

(With report of a case)

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HEMATOCOLPOS, the accumulation of menstrual blood in the vagina, is a rare disturbance which may be either congenital or acquired. There have been about two hundred cases[1,2,3,9] reported in the literature.

Embryologically,[12] the upper two-thirds of the vagina is derived from the Müllerian ducts, while approximately the lower one-third and the hymen are derived from the urogenital sinus. The lumen of the vagina is formed from a solid cord by dissolution of the cells in the center of the cord. Thus, the hematocolpos[11] may be due to either imperforate hymen, which in some cases seems to be familial, or it may be due to a congenital retrohymenal atresia. Hematocolpos[11] may also occur when there is a double vagina with one outlet occluded.

Acquired hematocolpos[3,11] or hematocolpometra may be due to injuries at time of delivery and their sequelae, operative procedures on the uterus and cervix, agglutination of the labia as a result of chronic infection or uncleanliness, or lacerated[4] wounds of the perineum.

About eighteen cases[5,7,8] of so-called hydrometrocolpos have been reported occurring in infancy. The uterine glands[7] are the source of the fluid. The estrogenic hormone, of maternal origin, physiologically produces a discharge from the vagina of the newborn infants. Two cases[5,8] have been reported in which there was edema and cyanosis of the lower extremities due to pressure on the pelvic vessels.

The main symptoms[6,11] of hematocolpos are amenorrhea, pain, inability to void or difficulty in voiding, abdominal enlargement, protruding mass at the vulva, and pain on sitting. The long-standing distension which must have occurred in many of these cases does not necessarily produce sterility.[13] If hematocolpos[10,11] has developed, it is wise to avoid all unnecessary instrumentation, as ascending infection and peritonitis may occur.

CASE REPORT

C. K. was a 13-year-old white female who had been having crampy lower abdominal pains for about six months. These pains had lasted for a few days and had occurred approximately every month. Her mother thought they were menstrual cramps, but so far there had been no menstrual bleeding. Two days before admission she seemed to have more lower abdominal pain and complained of trouble sitting because of "something in the vagina." Since that time there had been some polyuria. She had vomited once the day before admission and twice the day of admission to the hospital.

Examination disclosed a well-nourished white female. Temperature was 98.8°; blood pressure 130/80. The head and neck were normal. The skin and lymphatic system were normal. The fundi were negative. The ears were negative. There was slight redness of the throat. The heart and lungs were normal. The breasts were adolescent in type. The abdomen was obese. The liver, spleen and kidneys were not palpable. There was no suprapubic mass felt; however, there was some suprapubic tenderness. There was no tenderness in the cecal area. Examination of the genitalia showed a bulging of the hymen below the urethral opening. No vaginal opening was seen. On rectal examination a large, fluctuant mass was felt pushing into the rectum. The extremities were normal.

Accessory clinical findings: urine normal; white count 15,400 with 88 per cent polymorphonuclears and 11 per cent lymphocytes; hemoglobin 87 per cent.

It was felt that she had hematocolpos due to an imperforate hymen. A hymenotomy was done, and a pint of old blood, mucus and degenerated endometrial tissue was evacuated. The vagina was normal in appearance. The cervical os readily admitted one finger on digital examination. The uterus was somewhat dilated. Prior to discharge from the hospital all previous symptoms disappeared.

She was seen two weeks following the hymenotomy, at which time the vaginal introitus was patent and she had no special complaints.

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Strumpel-Marie Encephalitis

A Convulsive Disorder in Children Followed by Hemiplegia of Unknown Etiology

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Convulsive disorders in children are very dramatic and usually clear-cut as far as etiology is concerned. The commonest cause of convulsions in children under the age of four years is a tonsillitis or pharyngitis accompanied by a temperature of 104° or above. Spinal fluid in these children is uniformly normal, but physical examination reveals an acute tonsillitis, pharyngitis, or otitis. Simple treatment of the underlying cause suffices, and most of the children never have another convulsion. It is thought that about 10 to 20 per cent of children under four who have recurrent febrile convulsions, will later develop idiopathic epilepsy. The high temperature acts evidently as a trigger mechanism, bringing the epilepsy to the fore earlier than it would ordinarily be detected. For this reason, I have had electroencephalograms made of all patients who have had two or more febrile convulsions.

The other convulsions seen in infants and children are usually caused by (1) meningitis or meningo encephalitis, in which the spinal fluid contains cells and increased globulin; (2) spontaneous subarachnoid hemorrhage, in which blood is present in the spinal fluid; (3) idiopathic epilepsy, with intermittent spells, no associated infection, and clear spinal fluid; and (4) hypoglycemia, in which the blood sugar is markedly depressed. Also, more rarely, convulsions may be caused by (5) brain tumors, usually with persistent vomiting or headache as the presenting symptom, and (6) low calcium tetany.

Attention should be called to a peculiar syndrome, occurring in healthy children, characterized by acute onset, high temperature, convulsions, normal spinal fluid and followed by hemiplegia and sometimes convulsions. In 1884 Strumpel suggested that such hemiplegia in children, characterized by these symptoms of fever, convulsions, and sudden onset, was due to a primary encephalitis of the cerebral cortex and that the virus concerned was the same as that which caused poliomyelitis. Clinical and anatomic proof are lacking in support of this theory. In our own epidemic in 1946, there appeared to be not a single case of hemiplegia. Batton, on the other hand, stated that on clinical grounds it seems probable that about 10 per cent of all infantile hemiplegias are caused by the virus of poliomyelitis. This estimate seems excessive to most authors.

Only a few pathologic reports are available, as these children seldom die of the primary illness. In 1888 Abercrombie described the case of a child who developed hemiplegia without any preceding illness but whose autopsy showed occlusion of the middle cerebral artery. Ford substantiates this further when he says that only vascular lesions have been found in the few cases in which the fresh lesions have been studied.

In nineteen cases of infantile hemiplegia in otherwise normal children presented by Ford in 1927, the spinal fluids in all were normal. In two cases operation revealed atrophy and scarring of the cortex in one, and thrombosed vessels and softening in the motor area in the other. The one autopsy revealed cortical softening and bronchitis.

Report of Cases

Case 1. An eleven-months old white female, who was apparently normal in every way and had started to walk, but the day before admission had suddenly developed acute illness with fever, chills and continuous convulsions. She was admitted to the local hospital where sodium phenobarbitol and chloral were used to control the convulsions. At this time she had a temperature of 104°; a leukocyte count of 7200, with 70 per cent neutrophiles and 30 per cent lymphocytes; a hemoglobin of 10.8 grams with an erythrocyte count of 3.71 million; and a urine with an occasional leukocyte and 1+ albumin. After twenty-four hours, the temperature was still 104°, the convulsions had stopped but the child could not move the left arm and leg. On the second day, the leukocyte count was 17,200 with 40 per cent neutrophiles, 48 per cent lymphocytes and 12 per cent mononuclears. Physical examination was negative except for the left hemiplegia. Spinal puncture on the second day revealed clear fluid, normal pressure, one cell, Pandy trace, and sugar 98 milligrams per cent. Penicillin and streptomycin were started, and I saw her on the fourth day. At this time she had a temperature of 99.8°, normal eye grounds, left lower facial paresis, and left hemiplegia with 3+ deep reflexes and absent abdominal reflexes on the left. The child was somewhat stuporous. Spinal puncture revealed clear fluid, 180 millimeters of water pressure and negative Pandy. Subdural taps were also normal. On symptomatic treatment, the child's mental condition gradually cleared, although the left hemiplegia persisted. She was discharged on the eighth hospital day. Plan of treatment included physical therapy to the left arm and leg to be carried on by the parents at home and sodium dilantin ½ grain at bedtime to obviate any convulsions. She was told to return in six weeks, when an electro-encephalogram will be obtained.

Case 2. A two-and-one-half year old white female, who three days before admission complained of pains in hands and feet and limped slightly on the left leg. The next day she developed a temperature of 101° F. and early on the day of admission it went to 106°F. At this point the child became unconscious and began having generalized convulsions.

On admission she was comatose, convulsing and having a great deal of respiratory difficulty due to a large amount of mucus in the throat. When this was suctioned, she improved immediately. Her pupils were pin-point, tonsils were acutely inflamed, and the extremities were alternately flaccid and spastic.

Lumbar puncture on admission revealed one cell and a normal protein. The urine contained 8 to 12 hyaline and granular casts, an occasional white blood cell and a 1+ albumin. Blood sugar was 111 mg. per cent. The white blood cell count was 12,550 with 70 per cent neutrophiles, 23 per cent lymphocytes, six per cent monocytes and one per cent eosinophiles. Hemoglobin was 83 per cent. Chest x-ray was negative. She was treated symptomatically with oxygen, fluids and penicillin, and the temperature returned to normal by the sixth hospital day. Two blood cultures taken on admission were negative on the sixth day and the throat culture revealed a nonhemolytic staphylococcus aureus. The child was alert by the third day, but right up to the day of discharge which was the ninth day, she had difficulty sitting and standing, i. e., she seemed to be quite stiff. I have seen her on two occasions since discharge and she seems to have made a normal recovery. She has had no more convulsions and a hemiplegia has never developed.

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Case 3. A two year old white female who first became ill in 1946 with high temperature and generalized convulsions. Spinal fluid examination, blood counts and cultures, etc., were all normal.

Shortly after the onset of the convulsions, which were partially controlled with chloral hydrate, she was noted to have a left hemiplegia involving both the arm and leg. As this continued after leaving the hospital, she was referred to the Curative Workshop in Minneapolis for exercises. One year after the onset of the illness, she developed occasional petit mal spells and continues to have them, but since they are infrequent she has never required treatment. She is attending Dowling School now and getting along very nicely. She still has the left hemiplegia, but it is mostly confined to the left arm now.

She has never had an electro-encephalogram.

SUMMARY

1. Three cases of Strumpel-Marie encephalitis, or infantile hemiplegia of unknown etiology, are reported.

2. The possible causes with review of the literature are given, showing that most authors feel that this disease is caused by a vascular lesion of some type.

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(Continued on page 191)

A Case of Rocky Mountain Spotted Fever in Mankato*

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Rocky Mountain Fever is an acute specific non-communicable tick-borne disease, first discovered in the northwestern part of the United States. The tick itself is not affected by the disease. It does not immediately attach itself but may be on the body from one to two hours before it takes hold. The longer an infected tick feeds, the more likely it is to infect the host. Clinically, it resembles typhus fever and is characterized by a few days prodromal symptoms such as listlessness and malaise, followed by a chill and continued fever, severe headache, pain in the bones and muscles. When the pulse rate remains below 120 per minute, the patient's condition is considered good. A rate over this is a bad omen. A macular, and sometimes a maculo-papular, eruption appears about the third day of the fever, showing first on the wrists, ankles and back, then rapidly becoming generalized. If spots remain discreet and pinkish, prognosis is more favorable.

Ever since the recognition of the fact that the disease is widely distributed over the United States, the number of cases reported each year has remained a little short of 1000. All ages and both sexes are equally susceptible to the disease, but children withstand infection better than adults. The activity of the adult tick determines the seasonal preference of the disease in man. Spotted Fever season is usually considered to be over by July 15 when the adult tick has begun estivation. The rickettsia of Rocky Mountain Spotted Fever require apparently a warm-blooded and a cold-blooded host. Experimentally, many wild rodent species are susceptible to the disease in a mild form and are capable of infecting thousands of ticks which are permitted to feed upon them during the acute stage. In the western United States, the adult tick has long been known to be the principal intermediate host responsible for human cases. Man plays no part whatever in the propagation of the disease. His infection is purely accidental and usually occurs through the bite of an adult tick, male or female.

The rickettsia, the causative agent, is a gram positive, polymorphic, intracellular-like organism described by Wohlbach. The organism has been grown on living tissue but never on non-living tissue. Incubation period in experimental animals varies from 2 to 8 days according to the method of inoculation, the virulence of the strain, and the kind of animals used. Injected guinea pigs developed a marked febrile reaction which is followed by death in many instances. Fatality rate in the guinea pig varies from 7 to as high as 95 per cent. Some patients are very sick with an anxious expression, dry, coated tongue, and usually some exudate on the gums and on the tonsils.

Cases are often confused with typhus fever but this case was examined by Dr. A. J. Liedloff, acting director of the Health Unit number 2, and by Dr. A. S. Proguski of the State Board. They saw the patient, O. B., aged 7, at the Immanuel Hospital in Mankato. The following history was obtained on or about July 10, 1948.

The patient's sister had removed an engorged tick from the boy's scalp. No scar was observed at any time following the bite. In addition to the patient, the household consists of the parents, a sister 13 years old, and a brother 17 years old. All of them are well. The farm, in a hilly, wooded, rather wild area ten miles south of Mankato, was visited by members of the State Board. The usual farm animals, including a long-haired collie dog, were reported to be free of ticks, but the mother said that ticks were often found on the children returning from playing in the woods around the nearby school house. No new animals had been introduced to the farm nor had the patient visited away from the neighborhood. There was a history of measles and mumps.

First symptoms, on July 20, were headache, malaise and fever. On July 21 the patient vomited, and the following day had shaking spells and fever up to 104.5°, according to the mother. On July 24 a rash similar to scarlet fever appeared first on the face and then on the trunk and extremities. This time the patient had watery eyes and some photophobia. On July 26, when he was admitted to the hospital, he had a temperature between 97.4° and 105.2°. There was still a faint papular rash present on the trunk and extremities. The spleen was palpable, with slight cervical adenitis. Heart had a systolic murmur at the right apex, rate 128. Lungs showed some dulness at the right base posteriorly, no râles or bronchial breathing. The abdomen was relaxed with no tender areas. All reflexes normal, no neck rigidity. The tongue was heavily coated with a grayish exudate on the gums and tonsils. The nose bled easily when examined, and there was history of intermittent nose-bleed during the sickness, especially during the height of the fever. The x-ray showed increased bronchial vascular markings.

During the patient's stay in the hospital, he developed a marked edema of the face and extremities. He was acutely ill and at times was irrational. Temperature continued high to August 1. On the following day his temperature was between 99° and 101°, and on August 4, it was 99°. Urine showed an acute nephritis, albumin

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*Presented at the fall meeting of the Northwestern Pediatrics Society at Bayport, Minnesota, September 30, 1949.

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1+, two coarsely granular casts, few hyaline casts and a few pus cells. August 5, the patient appeared quite well. A discreet, pinkish fading rash was present on the body and extremities. The face, palms of the hands, and soles of the feet were clear.

The blood picture on July 26 showed WBC 5,800 and hemoglobin 74 per cent, and on July 28, 8,000 WBC. Differential lymphs 14, PMN 77, stabs 6, juveniles 1. The blood specimens received at the University in the section of the medical laboratory showed agglutination absent on July 29, with B typhus B, para-B and brucella antigen. On July 30, agglutination was absent with bacteria tularense, Weil-Felix reaction present with proteose OX 19 1-320 absent with OX 2. On August 6, agglutination present with OX 19 1-1280, OX 2 ± 1-80.

A report from the National Institute of Health, Bethesda, Maryland, received on August 14, on the examination of two blood specimens from this patient read as follows: "Specimen number 1 was a pool from blood drawn July 28 and July 29. Specimen number 2 was collected August 5. Specimen number 1 when treated for Rocky Mountain Spotted Fever gave a complement fixation test positive in dilution greater than 1-64, and when treated for endemic typhus gave a complement fixation test positive 1-32." A letter written by Dr. Dean S. Fleming, chief of the section of preventable diseases, University of Minnesota, says, "In reviewing the report from our board and from the board in Maryland concerning O. B. and also reviewing the history of the case, bearing the tick-bite in mind, they state we have counted this as a case of Rocky Mountain Spotted Fever." Again quoting from a letter written by Dr. Shelshley and Dr. Eckland of the Minnesota State Board, they say: "Clinical history and physical findings in the case of O.B. compatible with diagnosis of Spotted Fever."

The patient was treated with sulfadiazine before admission to the hospital and the first two hospital days. During the hospital stay he was given streptomycin and para-aminobenzoic acid. The boy left the hospital in good condition and has been well ever since.

CHILD CARE ABROAD

Europe. Standards of child care, for example, are generally high in Europe; but advances are continually being made, both in Europe and elsewhere, which cannot be fully exploited without close co-operation between countries and wide exchange of knowledge and techniques. The problem of protecting children against whooping cough is now receiving special attention in the United Kingdom in a large-scale trial vaccination campaign being undertaken with advice from an outside specialist whose services were requested from WHO by the Government. Heart surgery, especially with regard to the condition which produces "blue babies", recently has seen some startling developments. In many cases "blue babies" can now be restored to health. A "Congenital Heart Disease Team" is now being recruited by WHO to demonstrate, in a number of European countries, diagnostic and surgical techniques already being used successfully by specialized teams in a few areas of the world.

The BCG vaccination campaign against tuberculosis is progressing throughout the world. As of March 1, 20 million children and young adults have been tested, and about 10 million vaccinated against tuberculosis. Mass vaccination campaigns were completed in Czechoslovakia and Finland last summer, and will finish in Poland this spring. Work is under way in Austria, Greece, Yugoslavia, Morocco, Ceylon, India, Pakistan, Algeria, Tunisia, Italy, Egypt, Israel and Lebanon. Campaigns will soon begin in Syria, Malta, Mexico and Ecuador.

India. Over fifty pediatricians, obstetricians, teachers of nursing, and child-welfare workers from all India took part in a recent four-day symposium held at New Delhi. Practicable measures for reducing infant deaths, and for providing improved maternity care on a nation-wide basis were formulated.

Chile. Two "iron lungs" have been flown to Chile by the WHO Regional Office for the Americas (Pan America Sanitary Bureau) to help fight an outbreak of poliomyelitis. This shipment is to be followed by a team of specialists set up by the PASB to assist local health officials in organizing measures against the disease.

Notes from the *WHO Newsletter*

The Diagnosis and Treatment of Bronchial Asthma in Pediatric Practice*

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A correct diagnosis of bronchial asthma is ordinarily made without difficulty at any age. An incorrect diagnosis is perhaps more commonly made in infants and children than in older individuals. There are two principal reasons for this: (1) congenital stridors of various origins are not rare at this age and often produce a wheezing type of respiration, and (2) unsuspected foreign bodies in the bronchi occur more commonly in infancy and childhood than in older age groups and may simulate the signs and symptoms of bronchial asthma to an exceedingly misleading degree. Little harm may be done by continued observation in most cases of congenital stridor, but procrastination in the case of a foreign body may lead to very serious complications and even death. In all cases of wheezing of doubtful origin a roentgenogram of the chest should be made and then, if there is any doubt concerning the presence of a foreign body, bronchoscopy is mandatory.

A suggested definition[1] of bronchial asthma, which, if adhered to closely, should lead to a correct diagnosis, is as follows: "Bronchial asthma may be defined as a form of obstructive emphysema involving both lungs throughout, characterized by paroxysmal attacks of dyspnea, accompanied by wheezing, chiefly expiratory, heard on auscultation of the chest and typically relieved, at least in the early stages of an attack, by sympathomimetic drugs." To this might be added the fact that the attacks are chiefly nocturnal. However, the younger the child the less prominent is this particular feature. This definition emphasizes the important fact that bronchial asthma is only one form of obstructive emphysema. It is, however, the most common form. If this fact is kept in mind the use of the confusing terms, "nonallergic asthma" or "para-asthma"[3] may be avoided. All so-called asthmas in these groups are other forms of obstructive emphysema and should be so designated.

There are certain differences in the signs of bronchial asthma between children and adults, particularly up to the age of two years. This is probably correlated with the fact that the infantile type of respiration, chiefly abdominal, changes toward the adult type, chiefly thoracic, with the assumption of the upright position. This, as a rule, is well under way by the end of the second year.[4] The principal differences are: (1) the dyspnea in infancy and childhood is not so characteristically expiratory, as in older individuals; (2) the asthmatic infant may appear relatively comfortable, even when flat on his back—probably due to the abdominal type of respiration together with the greater softness and flexibility of the thoracic cage; and (3) the absence of an expression of anxiety on the part of the child is often in striking contrast to that of the adult.

If the child is seen between attacks, latent wheezing may be demonstrated on auscultation of the chest by having the child expire forcibly, as described by Clarke.[5] If the child will not cooperate the same sign may be elicited in the manner described by Fineman[6] which consists in the production of similar expiratory wheezing by compressing the thorax forcibly with the palm of the hand or with the forearm, while listening with the stethoscope. Although the diagnosis of bronchial asthma may usually be made with considerable accuracy from the history alone, it cannot be positively established unless the patient is seen in an acute attack. It is a clinical and not a laboratory diagnosis, and the patient should never be referred for skin testing "to see if he has bronchial asthma."

Since noisy breathing is a cardinal sign of bronchial asthma, even slight variations in normal breathing may be suspected by anxious parents as the first evidence of bronchial asthma, particularly in those families who, because of the presence of the disease in a parent or sibling, are worried about its development in their child. Even the stridor produced by the vibration of a slight excess of mucus in the nose or throat of the infant or by enlarged adenoids may be thought to be bronchial asthma.

In very young infants capillary bronchitis (bronchiolitis) may strongly resemble asthma accompanying an infection. Indeed, the wheezing in this disease may often be relieved by sympathomimetic drugs or aminophyllin. The relationship of these diseases to allergic bronchial asthma has not as yet been worked out. It is possible that eventually these diseases will be shown to have the same relationship to bronchial asthma as asthmatic bronchitis. In this disease the attacks are accompanied by evidence of a respiratory infection. The fact that asthmatic bronchitis is, in my experience, always followed by bronchial asthma if the child continues to have pulmonary difficulty would suggest that asthmatic bronchitis is the form which pulmonary inflammation commonly takes in the allergic or potentially allergic child.

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*Presented as a lecture in a postgraduate course in pediatrics at the Center for Continuation Study of the University of Minnesota School of Medicine, Minneapolis, Minnesota, April 7, 1949. Most of the material for this presentation is taken from two previous publications [1,2] by the author and is freely quoted by permission of the copyright owners.

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Other infectious conditions which may be mistaken for bronchial asthma are bronchiectasis,[7] bronchostenosis[8] and acute laryngotracheobronchitis. Irritation of the lungs due to dust[9] or other substances may also cause a type of wheezing respiration. The cough of pertussis is, in some instances, very difficult to distinguish from that of the asthmatic.

Intrathoracic neoplasms, especially enlarged nodes from various causes as Hodgkin's disease or tuberculosis, in rare instances an enlarged thymus, and inflammatory conditions of the mediastinum may cause obstructive emphysema by pressure. The pulmonary manifestations of cystic fibrosis of the pancreas are not infrequently mistaken for bronchial asthma. Retropharyngeal abscess, congenital anomalies of the larynx, and tracheal vascular rings[10] may also produce an asthmatic type of stridor. In the case of the latter, although congenital, it is important to remember that the stridor may not appear for some time after birth.

Sighing dyspnea,[11] a disturbance of respiration of psychic origin which strongly resembles bronchial asthma, while rare, does occur in childhood.[1] Ayerza's disease,[12] a very uncommon chronic pulmonary disorder accompanied by wheezing, is difficult to distinguish from bronchial asthma. Bronchotetany, a form of tetany in which the manifestations are largely limited to spasm of the musculature of the bronchial tree was at one time frequently discussed in the German literature[1] but has never been reported in English. It is said to strongly resemble bronchial asthma. It is interesting that in this disease the dyspnea is made worse instead of being improved by the injection of epinephrine. Cardiac asthma, not uncommon in adults but rare in children, has been seen by Clausen[13] in a girl of 11 years and a boy of 12, the youngest cases on record.

TREATMENT OF BRONCHIAL ASTHMA

The most important form of treatment of any disease, including asthma, is, of course, prophylaxis.[14] Of at least equal importance to the symptomatic treatment is the attempt by careful history taking, examination, observation and special tests to determine the exciting causes.[15] Another important problem involved in this disease is the management of the child with chronic asthma.[16] The present discussion, however, will be limited to the treatment of the acute attack.

Certainly one of the most common precipitating factors of an asthmatic attack at any age is an acute upper respiratory infection. This has led to the belief by some that infection is the principal cause of asthma. The allergic individual who has asthma suffers from a chronic clinical or subclinical edema of the membranes of the respiratory tract or a potential edema which develops into clinical edema on exposure to particular allergens. Because of this, these membranes are, like all other tissues with poor circulation, particularly subject to infection and when infected the patient reacts with asthma as the expression of a particular type of allergic reaction. The prevention and treatment of infections is a highly necessary procedure but should not lead one away from a constant search for basic causes. It is possible that in some cases the offending allergen may be the infectious agent itself but our knowledge concerning this is very incomplete. In some instances what appears to be the onset of an acute upper respiratory infection may be the expression of an allergic reaction involving the membranes of the upper respiratory tract and unrelated in any way to an infectious agent.

If the upper respiratory infection or "cold" can be prevented or aborted the asthmatic attack may often be prevented. Suggested measures for this purpose, besides, of course the complete study of the patient from the standpoint of allergy, are as follows:

(a) It may in some instances be possible to abort a "cold", either infectious or allergic, by the administration of an antihistaminic drug *immediately* at the very first aura of a cold. This procedure, which has been advocated by Brewster,[17] appears to be highly successful in some instances. The older patient can often recognize almost the very moment of the beginning of a coryza. This may be a familiar feeling of malaise or a scratchy sensation in the throat. The mother of younger children can often detect the aura of a coryza by changes in the behavior or appearance of the child. This is the time to start the antihistaminic. The later it is started the less satisfactory will be the result. A teaspoon of the Elixir of Benadryl (10 mg.) or of Elixir of Pyribenzamine (30 mg.) or larger doses of the capsules or tablets may be given every four hours, depending upon the age of the child. Once the cold is established the same drugs may give some relief by virtue of their sedative and drying effects. While the antihistaminic drugs unquestionably relieve asthmatic attacks in some individuals, they never relieve very severe asthmatic attacks. In any case, if they do not immediately relieve the asthma, they should not be continued because of the drying effect upon the secretions of the bronchi.

(b) There are a certain number of cases where an upper respiratory infection may be aborted and a subsequent attack of asthma prevented by the immediate administration of penicillin aerosol, 75,000 to 100,000 units three or four times a day until the danger of the attack has passed. Either the liquid or the powdered penicillin aerosol may be used. The former appears to be less irritating and is easier to administer to children. The parents are taught how to do this at home using the hand bicycle pump* as described by Finke.[18] As newer and, it is to be hoped, more effective drugs continue to appear and techniques improve, more is to be expected from this method of treatment. Davis[19] has recently reviewed the use of aerosol therapy in office practice.†

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*The modified bicycle pump for use with a DeVilbiss No. 40 vaporizer is now marketed by the DeVilbiss Company as the hand pump vaporizer combination No. 740.

†Since this lecture was given, because of the wider adoption of the present convenient methods for administering large doses of penicillin intramuscularly and the discovery that a number of these individuals are greatly benefited by aureomycin given orally at the onset of an upper respiratory infection, penicillin aerosol is given much less frequently than formerly.

(c) In a limited number of instances patients with recurrent upper respiratory infections followed by asthma may be greatly helped by the daily and continuous use of sulfadiazine (or combined sulfonamide drugs) in the same manner as that employed for the prophylaxis of rheumatic fever. Usually 0.25 to 0.50 gm. are administered orally two or three times a day, depending upon the weight of the child. The usual precautions for the administration of sulfonamide drugs must be observed.

If, in spite of the above measures, the upper respiratory infection or the "cold" progresses and an asthmatic attack is threatened or has actually started, the following is offered as an attempt to outline an approach to the management of this situation:

1. *Put the patient to bed.* This protects from aggravating factors, as exercise and changes in temperature and humidity. If the patient is a potentially allergic child, by reason of the family history, or if he has had asthmatic attacks before, environmental control[15] should have been instituted, at least in his bedroom, which should be as free from house dust as possible, with sponge rubber or dust-proofed pillows and mattresses; glass wool or dust-proofed blankets; no animal pets with fur or feathers; and no odors of tobacco smoke, paint, cooking, etc. These should be routine measures, to be taken regardless of the history or skin tests.

2. *Start a cough mixture.* The following has been found to be highly satisfactory[2]:

Codein sulphate	0.25	gr iv
Ephedrine sulphate	0.40	gr vj
Glycerin	10.00	dr ij
Syrup of hydriodic acid		
Syrup of cherry N. F.		
aa qs ad	120.00	oz iv

A teaspoon of this may be given every three or four hours to a child three years of age or more. Smaller doses may be given proportionately to younger children and the various ingredients may be varied in amount as may appear desirable. The reason for the composition of this cough mixture has been discussed previously.[2] For a more expectorating effect without particularly changing the taste of the mixture, fluid extract of ipecac 0.20 to .30 cc. (3 to 5 minims) may be added. It must be remembered that the fluid extract is about sixteen times as strong as the more commonly used syrup of ipecac.

Occasionally an asthmatic attack may be checked by ipecac alone, a rather common procedure in folk medicine which has been particularly advocated by Ratner.[20] The drug is given for the purpose of producing vomiting which is often followed by relief of the asthma. The dose is 5 drops of the *syrup of ipecac* for infants one year of age or less with one additional drop for each succeeding year.[21] It is repeated every 15 minutes until the child vomits or until three or four doses have been given.

3. *Start nose drops.* The following formula has proven highly satisfactory[2]:

Ephedrine sulphate	1½	per cent
Dextrose	10	per cent
Chlorbutanol	½	per cent
Distilled water qs		

Drops containing oil or menthol should not be used.[2] Other nose drops are also satisfactory, particularly one-quarter per cent neosynephrine (Winthrop-Stearns), and occasionally Privine (0.05 or 0.10 per cent) (Ciba). The latter drops must be used with extreme care and for not more than a few days at a time as a disagreeable reaction of the nasal membranes to these drops may occur.

Nose drops containing a vasoconstrictor drug with penicillin (Par-Pen Nose Drops—S. K. & F.)* have definite value in nasal infections. It is possible that drops containing a vasoconstrictor drug with other antibiotics as bacitracin (Bacidrin—Upjohn) will be just as helpful with less theoretical risk of sensitizing the individual to an antibiotic as important as penicillin.

The drops are best instilled regularly just before meals so that if the child vomits after the medication the meal will not be lost and so that he can breathe easier during meal times, at bed time, and during the night as necessary to permit nasal breathing.

4. *Steam inhalations.* These are particularly useful where the air is dry, as in winter, or in dry climates. Steam is irritating to some children and in such cases should not be used. Medications, especially menthol, should not be added to the steam. Prigal[22] has, however, reported considerable success in the administration of aminophyllin, sulfonamides and antibiotics by means of steam and has devised an apparatus for that purpose.† The general use of this procedure, which appears to be very promising, awaits confirmation by other investigators.

5. *Oral administration of ephedrine.* Since there is but a small amount of ephedrine in the cough mixture, if the patient is not yet wheezing, or is wheezing only very slightly, additional ephedrine may be given orally, say 25 to 50 mg. (¾ to ⅜ grains) every four hours. Frequently a sedative or aminophyllin or both may be combined with the ephedrine. There are many satisfactory proprietary preparations of this character, some of which are enteric coated and may be given at bed time with the uncoated preparation to take advantage of the delayed action.

6. *Insert an aminophyllin suppository.* This procedure, devised by Dees,[23] is one of the most helpful therapeutic agents available for children with asthma. If the patient threatened with an asthmatic attack is not wheezing, a suppository should be given nightly at bed time until the danger of the attack is passed. For the treatment of the active attack it may be given every six hours. If it is not known whether or not the child is sensitive to barbiturates it is best to use a suppository containing only aminophyllin as the therapeutic agent; if the child can tolerate barbiturates these may be added.

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*A practical simple prescription for penicillin nose drops is as follows:

One soluble tablet penicillin G	50,000 units
Ephedrine sulphate	gr. iiss 0.03
Normal saline qs ad	Oz. ss 16.0

†Available from the Kaz Manufacturing Co., Inc., 540 Twelfth Ave., New York 18, New York.

Under the age of three or four years the dose of aminophyllin by suppository is 0.25 gm. (3¾ grains); over this age 0.50 gm. (7½ grains). There are many satisfactory suppositories of this nature on the market made up with bases which are allergenically inert in order to avoid the use of coca butter in patients who may be sensitive to chocolate. Occasionally the suppositories cause itching or burning, in which case they should be lightly coated with an anesthetic cream. If suppositories are not available, aminophyllin powder may be dissolved and administered through a catheter or the contents of a 10 or 20 cc. ampule of aminophyllin (0.25 gm.—3¾ grains or 0.50 gm.—7½ grains) may be used.

7. *Inhalation of epinephrine aerosol* 1/100. Should asthma occur and not be relieved by the foregoing measures, the inhalation of epinephrine aerosol is often highly effective. Some children as young as three years may be taught this procedure effectively but it is not commonly successful before the age of five or six years. The procedure is midway in effectiveness between aminophyllin administered rectally and the hypodermic injection of epinephrine. It is important to be sure that the instrument used is not mechanically defective. A De Vilbiss No. 40 vaporizer has been found satisfactory and is much less expensive than some other kinds in common use. After administration of the aerosol it is advisable for the patient to gargle, or, if too young for this, swallow a little water, in order to prevent irritation of the throat or stomach. Overdosage of the aerosol must be avoided by not using more than three or four inhalations at a treatment, depending upon the efficiency of the vaporizer.

8. *Epinephrine* 1/1000 *by hypodermic injection.* If, in spite of the above measures, the asthmatic attack continues, recourse should be had without delay to the hypodermic administration of epinephrine 1/1000 as the quickest and most effective method of stopping an asthmatic attack. *It should be mandatory that someone in the family of an asthmatic child be able to carry out this procedure.* Besides the obvious advantages for the child, the parents are usually impressed by the argument that if by this means they avoid even one house call by a physician it will more than pay the cost of the hypodermic syringe, needles and medication.

The two most common errors in this procedure are: (1) Too long a delay between the onset of otherwise unrelieved asthma and the hypodermic administration of epinephrine. It must be emphasized to the parents that the earlier the medication is administered, the more effective it is and the less the child will suffer. (2) Improper dosage of epinephrine. The tendency is to give too much. The proper dose is the smallest which will produce the desired therapeutic effect as this will also have the least undesirable side reactions. The dose commonly varies from 0.15 cc. (2 minims) in early infancy to 0.50 cc. (7½ minims) in older children, the amount depending considerably upon the individual and the severity of the attack. It is repeated every 10 or 15 minutes until relief or evidence of overdosage is manifested (pallor, patchy cyanosis, cold sweat, nausea and vomiting). In the presence of fever larger amounts are commonly necessary. The physician, and the parent, must learn by experience with the child his optimum dose for an attack of given severity.

Butanefrine (Winthrop-Stearns) is an epinephrine-like preparation which does not have a pressor effect or commonly as many disagreeable side reactions as epinephrine. It is not commonly as effective as epinephrine but when it is, it is much more agreeable for the patient. It may be tried first instead of epinephrine unless the attack is very severe. The dose is twice that of epinephrine 1/1000.

Epinephrine in oil 1/500, because of its slower absorption and consequently prolonged action, is of great value in some cases. The dose is commonly twice that of the aqueous preparation. Since the epinephrine is a suspension in oil, care must be taken to use a perfectly dry syringe; otherwise overdosage may occur. The child should not be sensitive to the substance from which the oil is derived (peanut with the Parke, Davis & Co. and Squibb preparations; sesame with the Winthrop-Stearns). A gelatin preparation is also available (Smith).

At times is may be desirable to administer sodium phenobarbital dissolved in the epinephrine 1/1000 solution. The dose is 0.032 to 0.065 gm. (½ to 1 grain).

The burning of "asthma powders" is a popular home remedy which may occasionally give relief when other commonly used measures have failed. The active ingredients are stramonium powder (2 parts) mixed with an oxidizing agent, potassium nitrate (1 part) and fuel such as powdered anise (1 part).[24] This is not recommended as a routine method of treatment as the smoke is irritating and the odor disagreeable.

Status Asthmaticus in Infancy and Childhood

If the child has not been relieved of the attack by the measures outlined above, he may then be said to be in "status asthmaticus." Because of failure of response to epinephrine, these patients are also said to be "epinephrine fast." This happens less commonly with children than with adults.

The most important error made in status asthmaticus is failure to keep the patient well hydrated.* Death may occur in asthma as a result of plugging of the smaller divisions of the bronchi and sometimes the larger divisions, with thick inspissated plugs of mucus which the patient cannot cough up and therefore cause suffocation. The secretions must be kept thin by plenty of fluids, parenterally administered if necessary, and by the inhalation of steam or otherwise dampened air. Because these patients have had repeated injections of epinephrine and have usually taken little or no nourishment, it is quite likely that their glycogen reserves have been depleted, so much of the parenterally administered fluids should contain dextrose. Brown[25] has advocated the intravenous injection of ethyl alcohol and this has been tried in children by Bacal and Pedvis[26] who feel it is of value. The suggested dosage is 2 cc. per Kg. body weight of 5 per cent ethyl alcohol in 5 per cent dextrose in saline solution. The alcohol may be given in 5 per cent dextrose

*I am indebted to Dr. George Piness for first bringing this to my attention.

solution if additional sodium is not indicated. I have not as yet had experience with this procedure.

Because the lungs are edematous and poorly aerated in status asthmaticus they are particularly susceptible to infection. I therefore routinely administer a large dose of procaine penicillin, 300,000 units, intramuscularly, which is repeated in 24 to 48 hours if the child is not well out of the attack. As with epinephrine in oil, the child should not be sensitive to the substance from which the oil is derived.

The single most useful drug in status asthmaticus is aminophyllin administered intravenously. It is highly effective and usually well tolerated. The lethal dose for aminophyllin in man has never been determined but is believed to be far beyond the therapeutic range. The dose for infants and children is the same in proportion to the body weight as adults (0.006 gm. per Kg. or 1/20 grain per pound) assuming that 0.50 gm. (7½ grains) is the correct dose to give a 150 lb. (75 Kg.) adult intravenously in this condition. Any leakage of aminophyllin around the vein into the subcutaneous tissue is exceedingly painful and when this occurs 1 per cent procaine should be immediately injected. Aminophyllin is also supplied in 2 cc. vials containing 0.50 gm. (7½ grains) for intramuscular injection. This, however, is very painful and if used should probably be given after an injection into the same site of one per cent procaine.

Generally speaking, opiates are considered contraindicated in the treatment of bronchial asthma because they depress the respiratory center diminishing the cough reflex. It is however occasionally necessary to use such a drug in those cases of status asthmaticus where aminophyllin is not tolerated or does not give a satisfactory result. I commonly use Demerol mixed with a little epinephrine 1/1000 (0.20 to 0.50 cc.) which, under such circumstances, while not influencing the asthmatic attack, does appear to exert a local action in slowing down the absorption of the Demerol and prolonging its action. The dose for infants and children is the same in proportion to the body weight as adults, assuming that the dose for an average adult of 150 lbs. (75 Kg.) is 100 mg. or 2 cc. of the standard ampoule.

The oxygen tent, provided the atmosphere is kept sufficiently moist, should be used in severe or prolonged asthmatic attacks without waiting for the child to show clinical evidence of cyanosis. I have not used helium and oxygen in children.

As yet I have not had under my care a child in uncomplicated status asthmaticus who has not responded to the above procedures.* Others have, and in such cases bronchoscopy is recommended for the purpose of aspirating the thickened secretions. The youngest patient treated by Holinger* was two years of age. It is evident, however, that if bronchoscopy is to be done, it should be carried out fairly early and not as a terminal procedure and thus precipitate the exitus.

Ether and olive oil in equal parts administered rectally, one ounce per 20 lbs. body weight (3 cc. per Kg.) is recommended for adults but I have had no experience with this in children. The same is true of the use of avertin (tribromethanol) administered rectally although an occasional older individual has responded satisfactorily.

There is no evidence that vitamins have any specific value in the treatment of bronchial asthma. Potassium chloride, ethylene disulphonate, histaminase, hapamine and sulfur in oil have all been without value in the treatment of bronchial asthma in my experience.

SUMMARY

The most important conditions to be differentiated from bronchial asthma in infancy and childhood are congenital stridors and foreign bodies in the bronchial tree. Many other conditions are listed which must on occasion be considered in the differential diagnosis. Methods of aborting and treating the acute attack of asthma and status asthmaticus are outlined and discussed.

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*Since this lecture was given I have seen three adult asthmatics in consultation, all of whom were epinephrine fast and who were not relieved by the intravenous administration of aminophyllin or any other measures. All three responded to the administration of procaine by intravenous drip. The method used was that described by D. Schrum (J. Pediat. 34:433, 1949) for use in other conditions. The dose is 4 mg. per Kg. body weight of patient in an 0.1 per cent solution in normal saline or 5 per cent dextrose. In two of these cases the use of this procedure appeared life saving. I have not as yet had the opportunity of using this procedure in infants and children with status asthmaticus as I have had thus far no failures of response to intravenous aminophyllin in this age group.

*Personal communication to the author.

Chronic Intussusception in Infancy

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CASE REPORT

DALE B., male, age 7 months, was admitted to the Children's Hospital of Winnipeg on July 24, because of vomiting and loss of weight. The baby had been well until three weeks before admission. On July 3rd he was taken suddenly ill with "loose stools and colic." Four loose stools were passed within a few hours, and the baby seemed to have considerable intermittent discomfort. The following day the stools were still loose and on one occasion the mother noted blood in the stool. Vomiting occurred on July 4th, 5th and 6th, after every feeding. The stools became normal on the fourth day of illness and remained fairly normal from then on. For a few days there was no vomiting but then it was resumed and continued intermittently to the day of admission, occurring usually about an hour after a feeding. The baby appeared to have severe "cramps" almost every day, and there were several episodes of screaming and drawing up of legs. There was a loss of three pounds in weight during the three-week illness. Because of the continued vomiting, recurrent abdominal pain, and marked loss of weight, the child was referred to hospital by the attending physician.

Intravenous fluids and oral glucose series were started. Consultation on the second hospital day found a listless baby with evidence of marked recent weight loss. His temperature was normal. The abdomen was moderately distended and a mass was felt in the epigastrium. Palpation of the mass caused the baby to draw up his legs and whimper. The mass had a doughy feel and was difficult to outline but seemed to fill the entire epigastrium. Rectal examination was negative.

Observed during a feeding, the baby seemed hungry but as soon as he began to take the feeding showed signs of extreme discomfort. He would stop feeding at frequent intervals, stiffen out his body and scream. The mother was then asked to recall the details of the onset of the illness with particular reference to blood in the stool. She remembered then that the "blood in the stool" on the second day of illness was considerable in amount—she thought "about a cupful."

With the history of an acute onset of abdominal pain, the passage of blood in the stool, the persistence of vomiting and marked wasting over a three-week period, a diagnosis of chronic intussusception was made. A barium enema was given. The radiologist's report was as follows: "The opaque enema filled as far as the mid-transverse colon where there was definite evidence of an intussusception. This appeared unusual in that there was a large amount of small bowel filling the cecum, ascending, and part of the transverse colon." (See Figure 1.)

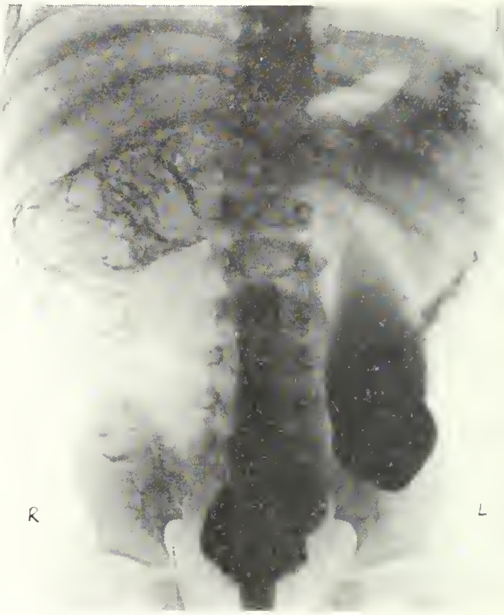

Fig. 1. Head of intussusception near splenic flexure. Note absence of small bowel dilatation.

At operation (by Dr. M. R. MacCharles) the intussusception was reduced with considerable difficulty. The apex of the intussusception consisted of small bowel which had advanced to the splenic flexure. The bowel was extremely congested but the circulation seemed to be unimpaired. Recovery was uneventful. The child took his feedings well. There was almost no postoperative vomiting and intravenous therapy was discontinued on the third postoperative day. He was discharged from hospital on the tenth postoperative day—exactly one month from the date of onset of his symptoms. He has remained well.

DISCUSSION

Chronic intussusception occurs very infrequently in infancy. In 1945 Garvie and Kemp[1] reviewed the British literature from 1873 and collected 62 cases, to which they added three of their own. Thirty-three occurred in the first three years of life, and ten occurred in infants under one year of age. In 1947 Wyllie and Pugh[2] reported three cases, one of them an infant aged three months. Mayo and Phillips[3] reported a series of 39 cases in 1934, in which the youngest patient was ten years of age.

The onset of symptoms in a case of chronic intussusception is rarely dramatic. There may be no vomiting and blood may be absent from the stool. The onset often resembles an acute entero-colitis. Since the obstruction is not complete, normal stools may be passed. There is usually periodic vomiting, attacks of severe "colic" and progressive and rapid loss of weight. To quote Still[4]: "On a particular day the child seemed to have pain in the abdomen and vomited once or twice. During the next few days he occasionally vomited, generally in association with a colicky pain. The vomiting has become less frequent, only once in two or three days, and the pain is only occasional. The bowels which before were open daily, have since the onset been less regular—the stools have been normal; there has been no blood in the stool, or at most there has only been a streak once or twice, such as might be seen on the stool of any constipated child. The symptoms which had troubled the parents most is the wasting; the child after three or four weeks of these vague troubles is obviously getting thin. . . . Such is the history, and with a duration of some weeks even the finding of a more or less definite lump in the abdomen may hardly raise a suspicion of intussusception, especially when the mother's chief complaint is the wasting."

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In chronic intussusception, obstruction is incomplete or intermittent and interference with vascular supply of the bowel is minimal. It has been suggested[5] that a congenital type of mesenteric formation exists in such cases. Fusion of the peritoneum of the ascending and descending portions of the colon with the peritoneum of the posterior abdominal wall does not occur. There is a persistence of an ascending and descending mesocolon. The longer these mesenteries are, the less tension there will be on the blood supply of the intussuscipiens.

Intussusception in infancy may also occur in an intermittent or a recurrent form. In the intermittent form episodes of severe abdominal pain, with or without vomiting may occur. These episodes last a few minutes to a few hours and are followed by a period of complete relief from symptoms. The infant appears quite well for a day or two and then the symptoms suddenly recur. There is little or no loss of weight. The following is an example of this type of intussusception: Stanley N., age 26 months, developed sudden severe abdominal pain, and vomited once. The pain was intermittent and he would "double up" and hold his abdomen while it lasted. As soon as the pain left, he felt well and played about the house. He was carefully examined on the day of onset of pain. No masses were felt, and there was no abdominal tenderness. An enema produced normal fecal return. His symptoms recurred once or twice a day for four days. A leucocyte count was normal. He was seen by a surgeon on the third day, who did not believe he had a surgical abdomen. On the 5th and 6th day, he was completely free from symptoms. On the 7th day, his pain recurred again and was quite severe, although not more so than during the first attack. Abdominal examination was negative. A barium enema revealed an intussusception which was easily reduced at operation an hour later. There has been no recurrence.

The recurrent form is seen fairly frequently. Within the last eighteen months three operations have been performed for acute intussusception in a two-year-old child under my care. Gross and Ladd refer to a child who had four successive operations for intussusception.

Neither the intermittent nor the recurrent form should be classed as chronic intussusception. They are, in fact, acute intussusceptions with either spontaneous or operative reduction, and then recurrence in a matter of hours, days or weeks.

The case herein presented conforms closely to Still's description quoted above. The marked loss in weight becomes so prominent a part of the clinical picture that the possibility of an intussusception may be overlooked, as it nearly was in this case. In any infant with a history of vomiting, severe abdominal pain and marked loss of weight, even if the symptoms have persisted for many weeks, chronic intussusception should be considered as a possible diagnosis.

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Vascular Occlusion in Infancy*

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We are prone to think of embolism or thrombosis as occurring only in adults, yet vascular occlusion in children has been well recognized for some time.[1,2,3] Thus Gross[1] has been able to collect 41 cases from the literature and has added six of his own. The reason for the vascular occlusion in the pediatric age group is often not evident despite systematic search for the underlying defect. The following case was studied at the Children's Hospital in Winnipeg.

CASE REPORT

Reggie S., a male premature infant (birth weight 2200 gms.) was admitted to the Children's Hospital on December 1, 1948 at the age of 18 days because of blue spells and upper respiratory infection. These cyanotic spells began at the age of 12 days.

Physical examination was essentially negative. Temperature was 99.4° by rectum. X-ray examination of the chest revealed some residual atelectasis in the left lung. Cultures of the nasopharynx grew hemolytic staphylococcus aureus, coagulase positive. Hemoglobin was 10 gms., RBC 3.9 M, and the WBC 11,100. Urinalysis was negative.

On the third hospital day the infant developed blisters at the ends of the first and second toes of the right foot. These areas gradually became gangrenous and eventually the terminal phalanx of the first and second toes underwent spontaneous amputation. The skin of the area healed well by January 3, 1949 and the patient was discharged from the hospital. Discharge weight was 3300 gms. Figures 1 and 2 illustrate the changes occurring in this case.

As we were obviously dealing with a gangrene, an attempt was made to establish the cause of the impairment in the circulation. The dorsalis pedis and the posterior tibial vessels both pulsated well which places the obstruction distal to these points. Blood cultures to identify a septicemia with septic emboli were negative. X-ray examination of the heart and subsequent follow-up one year later revealed no evidence of congenital abnormality of the heart as a source of emboli.

Investigation of the clotting mechanism revealed a normal platelet count of 310,000 per cubic millimeter and a prothrombin times which was normal. There was no evident polycythemia and the clotting time by the Lee-White method was 4.5 minutes.

At re-examination at the age of one year the child was normal except of the missing terminal phalanx of the great toe and second toe of the right foot.

DISCUSSION

This case records a vascular occlusion in the limb in the newborn period. It was impossible at the time of the acute episode to determine the cause of this occlusion. Search was made in the vascular bed, in the clotting mechanism, and in the circulating elements for the cause of this disaster, but all search was futile.

Gross[1] in his discussion of the causes of vascular occlusion in infancy, pays attention to sepsis, congenital heart disease, trauma, closure of the ductus arteriosus and closure of the umbilical vessels as possible sites of embolic origin.

In cases that survive, one can only exclude as sources of emboli, such things as sepsis, congenital heart disease, and possible trauma. These were all excluded in this particular instance.

In the management of these cases, prevention of secondary infection and the maintenance of the metabolic activity of the part at a low level by keeping the limb at room temperature is imperative. One must lean to the conservative side in the treatment, for the final loss of tissue may be exceedingly small when compared with the original extent of impaired circulation. Gross has amply demonstrated this in three of his own cases and has cautioned against resorting to amputation too early.

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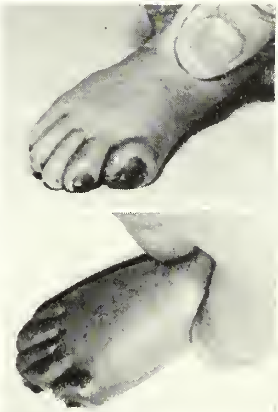

Fig. 1 (left). Appearance of toes during acute phase.

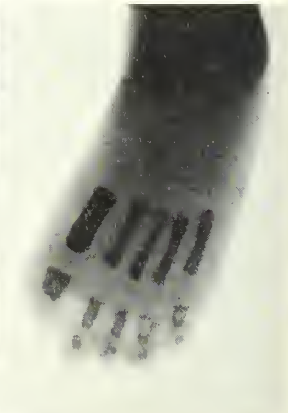

Fig. 2 (right). X-ray appearance of toes after acute phase.

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AMERICAN BABY WEEK

Baby Week in 1950 will be observed from April 29th through May 6th.

Tay-Sachs' Disease—Amaurotic Family Idiocy

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Tay-Sachs' disease is a progressive, uniformly fatal degeneration of the nervous system.[3] The retinal changes, which appear about the seventh to eighth month, consist of an opaque, whitish area in the macular area, which is due to the swelling and degeneration of the ganglion cells of the retina, with a blood red spot in its center.[1] Because of the rarity of this condition in Gentiles—only three cases verified by necropsy[1,2]—the following two patients are described.

Case Reports

Case 1. A 12-months-old white male infant, born spontaneously at term with a birth weight of 10½ pounds, apparently normal at birth. The parents first suspected he was retarded at the age of six months because he did not attempt to hold his head up or to sit up. Even earlier, he had not been as active as the older sibling, did not move around in bed, roll over, or move his arms and legs as much as he should.

Physical examination disclosed a 12-months-old white male infant, weight 12 kilograms, rectal temperature 103.8° F. The patient lay on his back without demonstrating much activity and made no attempt to grasp objects dangled before him. There was no general glandular enlargement. When the child was held in the sitting position, the chin rested on the chest. When placed on his stomach, the child did not attempt to raise his head or roll over. The pupils reacted to light equally. Ophthalmoscopic examination showed a moderate atrophy of both optic discs and a cherry red spot in the center of an opaque zone in both macular areas. Bronchus and crepitant râles were heard throughout both lungs. The spleen and liver were not palpable. The extremities were flaccid. Following any sudden noise, the child showed an exaggerated Moro type of reaction, first flexing and then extending all of his extremities. The other reflexes were essentially normal. There was no Babinski reflex. The Kahn, Kline, and Mazzini tests were negative.

The father was an orphan and knew nothing about his ancestry. The mother's family has been of English ancestry for at least four generations. There are no known retarded children in any branch of the family. There is one normal sibling, four years of age.

Case 2. A 15-months-old white female infant was brought to the hospital because of inability to sit unsupported or to stand. The prenatal, delivery, and neonatal periods were not significant. Her birth weight was 7½ pounds. This infant was thought to be normal until she was eight months of age. At this age she had made no attempt to sit up and would not roll over in bed. The parents did not notice any decrease in activity at this time but stated that she moved actively in her bed and would grasp and hold objects handed to her. The parents had noticed that she had become very nervous and that any noise would make her jerk her arms and legs and cry.

Physical examination disclosed a well-developed white female infant, weight 10 kilograms, rectal temperature 37.2°C., 98.7°F. The patient was a stupid-looking child, lying quietly in bed. There was no general glandular enlargement. She could not sit unsupported. The child made no effort to reach for objects held in front of her. When an object was placed in her hand, she would grasp and hold it for a few seconds. Any sudden noise made all her extremities flex, and she began to cry. Her pupils reacted to light equally. Ophthalmoscopic examination showed atrophy of the optic discs, and there was a bright cherry-red spot visible in both macular areas, in the middle of an opaque zone. The spleen and liver were not palpable. The patient was able to move her arms and legs actively. All her reflexes were increased. The Babinski reflexes were negative.

Both parents were of English ancestry and there never had been any Jewish blood in their family, as far back as they know. There was one sibling, four years of age, whose growth and development were normal.

Summary

Two cases of amaurotic family idiocy (Tay-Sachs' disease) in non-Jewish infants are reported.

* * *

My thanks are due to Dr. W. C. Davison, Dean, the Duke University School of Medicine, for his assistance in the preparation of this paper.

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(Continued from page 180)

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Treatment of Rheumatoid Arthritis and other Rheumatic Conditions with Salicylate and Para-Aminobenzoic Acid[*]

(*A study of 125 patients*)

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The history of the treatment of rheumatic affections with salicylates is a long and notable one. For almost three quarters of a century, indeed from the first writings of Stricker[1] and MacLagan[2] in 1876, the salicylates have remained the drug of choice in the treatment of the arthritides. The pre-eminence of the salicylates is so well known and universally accepted that one does not need to prove the point by documentation, even though this could easily be done.

Over the years many new salicylate compounds, such as acetylsalicylic acid, were synthesized and many combinations of salicylates with other substances, such as sulfur and succinates, were introduced into therapeutics. They did not, however, achieve any noteworthy improvement in salicylate therapy.

PROGRESS IN SALICYLATE THERAPY

The first significant advance in salicylate therapy came in 1946 with the demonstration of Dry, Butt and Scheifley[3] that the addition of para-aminobenzoic acid to the rheumatic fever salicylate regimen markedly increased the concentration of salicylate in the blood with an attending rapid remission of the signs and symptoms of the disease. In the words of the authors: ". . . there was a dramatic and complete clinical response . . ."

The elevated blood salicylate level was shown to be related to a reduction in the rate of its urinary excretion. In turn, the salicylate increased the blood concentration of para-aminobenzoate.

This latter fact is of importance since Rosenblum and Fraser[4] showed shortly thereafter that para-aminobenzoic acid apparently is itself an active antirheumatic agent. The administration of para-aminobenzoic acid alone resulted in ". . . a prompt fall in temperature and relief of joint pains." This constituted a new contribution but not a surprising one for it is well known that sodium benzoate and other benzoates have in common with the salicylates, although to a lesser degree, analgesic, antipyretic and antirheumatic activity.

These workers also observed one case in which para-aminobenzoic acid alone failed to give relief, probably because of inadequate dosage, but the addition of salicylate resulted in prompt remission. It appears, therefore, from this and the results of Dry and his associates that salicylate and para-aminobenzoate act synergistically. With this, Weston[5] concurs when he states ". . . para-aminobenzoic acid in conjunction with the salicylates . . . seems to have synergistic action."

The original findings of Dry and his co-workers have been amply confirmed.[6,7,8,9] One can accept as established, therefore, that salicylates and para-aminobenzoic acid have a reciprocal effect in increasing their concentration in the blood when they are administered together orally, that the increased blood salicylate level results from a decreased rate of the urinary excretion of salicylate, and that attending the higher blood salicylate level there is prompt remission of symptoms.

MECHANISM OF BLOOD ELEVATING ACTION OF PARA-AMINOBENZOIC ACID

With the objective of elucidating the mechanism by which para-aminobenzoic acid decreases the rate of urinary excretion of salicylate and elevates the blood salicylate concentration, Dry and other associates[7] carried out additional studies. It was found that there was a marked decrease in the conjugation in the body of glycine (amino-acetic acid) with salicylic acid to form salicyluric acid, and a corresponding fall in this urinary fraction. There was also a definite reduction in the free salicylate fraction.

Earlier work by Kapp and Coburn[10] indicated that the approximately 80 per cent of the sodium salicylate ingested by humans which is excreted by the kidney is present in the urine in four different forms and fractions, namely, salicylic acid, 20 per cent; salicyluric acid, 55 per cent; gentisic acid, 4 to 8 per cent; and the remainder is conjugated with glucuronic acid.

It is evident then from the work of Salassa, Bollman and Dry[7] that para-aminobenzoic acid significantly alters the two principal urinary salicylate fractions, i. e., free salicylic acid and salicyluric acid. Parker[9] found, also, that the free salicylate fraction is greatly diminished by the concurrent administration of para-aminobenzoic acid.

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Both groups are in agreement that the reduced rate of renal clearance of the free salicylate fraction is related to the shift occurring in the pH of the urine to the acid side. That a direct relationship exists between the pH of the urine and the renal clearance of free salicylate is shown also by the data of Hoffman and Nobe[11] and of Caravati and Cosgrove.[12] For example, when the pH of the urine is 6.2 to 7.9 salicylate excretion is 2 to 8 times as great as at the definitely acid pH of 4.8.

These data are in complete accord with the established fact that the simultaneous administration of sodium bicarbonate with sodium salicylate markedly reduces the blood salicylate levels[13,14] by promoting its urinary excretion.[9,11,12] Obviously, such administration of alkali reduces salicylate efficacy whereas para-aminobenzoic acid enhances it.

It is desirable, therefore, to maintain the urine on the normally acid side and of minimum volume to conserve maximally both the ingested salicylate and the para-aminobenzoic acid. Furthermore, it must be remembered that a significant factor of the blood salicylate elevating action of para-aminobenzoic acid is the reduction in the formation in the body of salicyluric acid and a corresponding decrease in this urine fraction. Apparently this action is not related to the pH of the urine but is a specific effect on the metabolism of salicylate in the body.

Mechanism of Antirheumatic Action of Salicylate

The dramatic relief afforded by the salicylates in the rheumatic affections has made it difficult for many to retain the idea commonly held that it is connected largely with the analgesic and antipyretic actions of salicylates. A large body of data[15] has accumulated during the last few years which sheds light on the nature of the rheumatic processes and the influence of salicylate thereupon. It appears that the action of salicylate may be a rather specific one involving the inhibition or inactivation of the enzyme hyaluronidase, the so-called "spreading factor." It will be recalled that hyaluronidase, present in certain tissue cells and in many strains of hemolytic streptococci, has as one of its substrates, hyaluronic acid, present in relatively high concentrations in the skeletal tissues of mesenchymal origin, viz., connective tissue, fascia, muscle, ligament, joint capsule, synovial membrane, articular cartilage and even bone. The site of the rheumatic lesion is in these tissues. However, it must be stated that while it appears that salicylate inhibits hyaluronidase, it has not been established definitely that a direct relationship exists between hyaluronic acid metabolism and rheumatic disease, although the evidence is suggestive.

Mechanism of Antirheumatic Action of Para-aminobenzoic Acid

As previously stated, the benzoates share in kind but to a lesser degree the actions of the salicylates. Whether the antirheumatic action of para-aminobenzoic acid involves the same mechanism as apparently does that of salicylate, i. e., inhibition of hyaluronidase, cannot be stated. It is possible that this is true, but until the results of studies along this line are published it is impossible to be specific.

Clinical Material

The present report deals with the clinical effectiveness of a combination of sodium salicylate and sodium para-aminobenzoate—Pabalate*—as compared with sodium salicylate alone, in a series of 125 patients with various types of rheumatic disease.

The rheumatic conditions represented in this study are summarized in Table I. Thirty-five of the patients had active rheumatoid arthritis—involving only the peripheral joints in 20, only spinal joints in 10, and both peripheral and spinal joints in five. Each of these patients had an erythrocyte sedimentation rate (ESR) greater than 30 mm. per hour. Aching pain and stiffness after inactivity, particularly on first arising in the morning were constant findings.

There were also 35 patients with moderate to severe osteoarthritis, demonstrable by roentgenograms as involving the knees of 15, the hips of 10 and the terminal interphalangeal joints (Heberden's Nodes) in the remaining 10. Fifteen additional patients had x-ray demonstrated osteoarthritis of the cervical spine which was complicated by radicular pain involving branches of the brachial plexus.

Thirty patients had primary fibrositis, characterized by pain and stiffness, brought on by inactivity and relieved by activity, heat and sodium salicylate.

Ten patients had chronic painful shoulder, with severe limitation of motion in all directions and aching and stiffness, which had persisted for more than thirty days prior to the present study.

Method of Study

Treatment of each patient in this series was instituted with the administration of sodium salicylate every four hours during the day and continued for seven days, in doses of from 0.6 gm. to 1.3 gm. The amount of the individual dose was that which gave relief of pain and stiffness without producing serious toxic symptoms. On the eighth day the sodium salicylate dose was replaced by one Pabalate tablet. The dose of this preparation was increased to two tablets every four hours on the thirteenth day and continued until the twenty-first day. At this time the degree of relief of pain and stiffness was evaluated and individual modifications of dosages instituted. No other treatment was given and no other observations were made during this period. Further studies are in progress in which relationships between clinical effects and blood salicylate and para-aminobenzoate concentrations will be investigated.

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*The salicylate—para-aminobenzoic acid preparation, Pabalate, used in this study was supplied by the A. H. Robins Company, Inc., Richmond, Virginia. Each enteric coated Pabalate tablet contains 0.3 gm. (5 gr.) each of sodium salicylate and sodium para-aminobenzoate.

RESULTS OF STUDY

The dosages of sodium salicylate and of the salicylate—p-aminobenzoate combination which were required to produce closely comparable degrees of comfort are shown in Table I. It will be observed that for the relief of pain and stiffness by the administration of sodium salicylate every four hours 35 patients (68 per cent) required 0.6 gm., 27 (21.6 per cent) required 1.0 gm., and 13 (10.4 per cent) had to have the larger dose of 1.3 gm. With the salicylate— p-aminobenzoate combination comparable benefit was achieved in two patients (1.6 per cent) with one tablet every four hours, in 115 patients (92.0 per cent) with two tablets, and only eight patients (6.4 per cent) required three tablets at a dose. The greater efficacy of this preparation is clearly manifested when one considers that whereas only 68 per cent of the patients got relief from 0.6 gm. doses of sodium salicylate, 92 per cent got equal relief on the same dosage of sodium salicylate in the form of Pabalate, probably because of its para-aminobenzoate component.

The greater efficacy of the combination over plain salicylate was quite evident also in its more prolonged effect. During the period of sodium salicylate therapy 89 patients (72 per cent) felt the need of an additional dose of the drug for from one-half to one and one-half hours before it was due. However, when the salicylate—p-aminobenzoate preparation was taken, only three patients (2.4 per cent) felt a decrease in the afforded relief or comfort prior to the succeeding dose.

The relief of pain and stiffness was more rapid with sodium salicylate than with the salicylate— p-aminobenzoate combination. The discomfort experienced on awakening in the morning was relieved by plain salicylate in 30 to 45 minutes, whereas the same benefit with Pabalate required three to four hours. Thus, in most cases the relief of discomfort during the first three and one-half to four hours after arising was not satisfactory with this preparation. However, this fact was not unexpected since its enteric coating requires approximately three hours to dissolve.

Twenty-two patients in the series had nocturia two or three times and 17 had nocturia one time. These patients were instructed to take their usual dose of salicylate— p-aminobenzoate one time during the night. In the case of those who arose more than once, the medication was to be taken as near to the middle of the sleeping period as possible. When this middle of the night dose of the combination was taken not more than five hours before arising, 31 patients (63.2 per cent) had around-the-clock benefit. There were eight patients who arose one time nightly, one or two hours after retiring who noted a gradual increase in discomfort between the first and second daytime doses. It is interesting to note that nine patients, who previously arose three times nightly before taking the salicylate— p-aminobenzoate combination, decreased to one time nightly when they were getting 24 hour benefit with this preparation.

Ten patients who, while taking sodium salicylate were awakened by pain one to two hours before their usual time to arise in the morning, were not awakened early when taking the combination. These same patients had relief of pain in 30 to 45 minutes and fell off to sleep if they began the daily schedule of sodium salicylate at that time rather than at the usual time of arising in the morning. On the other hand, with Pabalate they slept through the night but had discomfort several hours after arising. When these patients were instructed to take an extra dose of this preparation in the middle of the night, they had 24 hours of benefit.

At the end of the twenty-first day of the drug regimen a schedule of medication was prepared for each patient, based on the following facts:

1. The sodium salicylate-sodium— p-aminobenzoate preparation has a delay of four hours between ingestion and beneficial effect.

TABLE I
Comparison of Effective Dosage of Sodium Salicylate and Salicylate— p-aminobenzoate Combination

		Effective Dosage					
		Sodium Salicylate			Pabalate		
		(Grams)			Tablets		
Rheumatic Condition	Number of Patients	0.6	1.0	1.3	1	2	3
Rheumatoid arthritis, peripheral	20	13	5	2	0	17	3
Rheumatoid spondylitis	10	7	3	0	0	10	0
Rheumatoid, peripheral and spinal involvement	5	4	1	0	0	5	0
Osteoarthritis	35	22	6	7	1	32	2
Knee joints	15						
Heberden's nodes	10						
Hip joints	10						
Cervical osteoarthritis with radicular pain	15	11	3	1	0	13	2
Fibrositis	30	24	6	0	1	29	0
Chronic painful shoulder	10	4	3	3	0	9	1
Totals	125	85	27	13	2	115	8
Percentage	100%	68%	21.6%	10.4%	1.6%	92%	6.4%

2. This preparation given every four hours throughout the day and night produces 24 hour benefit.
3. When the salicylate— p-aminobenzoate combination was not taken in the middle of the night there was poor relief of pain during the first four hours after arising.
4. Sodium salicylate gives relief within 30 to 45 minutes.
5. Some enteric coated sodium salicylate has a delay of six to seven hours between ingestion and beneficial action.

Those patients who spent eight hours or less in bed were given salicylate— p-aminobenzoate every four hours during the waking hours and before retiring 10 grains of enteric coated sodium salicylate. Those who remained in bed eight to 10 hours each night were given uncoated sodium salicylate at the same time as their first morning dose of the combination. Both programs were successful in relieving discomfort.

The eight patients who required three Pabalate tablets every four hours for benefit comparable to that with sodium salicylate received this dose from the twenty-second to the twenty-eighth day. They were then given two tablets every three hours for one week with good benefit except in one patient. In this single instance there was better relief of pain with three tablets every four hours. These same patients had required 1.3 gms. of sodium salicylate previously.

Three patients not included in this series reported no relief with Pabalate and also stated that the tablets appeared in their stools. Examination of several of these tablets revealed that the contents were intact. However, when the tablet coating was punctured with a needle, benefit did occur and shells of enteric coating were recovered in the stool.

Degree of Benefit

The patients were asked to estimate the degree of pain relief with the two types of medication, on the basis of one plus for mild relief to four plus for complete relief of pain. The results are shown in Table III. There is a distinct shift to the right with the salicylate— p-aminobenzoate combination in both rheumatoid arthritis and fibrositis groups. In osteoarthritis, cervical osteoarthritis with radicular pain and chronic painful shoulder the shift to the right is less marked. However, the over-all picture of the degree of pain relief shows a distinct shift in the totals indicating greater benefit from the combination than from plain sodium salicylate.

Toxicity

Symptoms of toxicity were manifested by 69 (55.2 per cent) of the 125 patients in this series when taking sodium salicylate. When these patient were changed from sodium salicylate to the combination, adverse symptoms disappeared. Toxicity, intolerance or other adverse reactions were not reported by any of the patients during the administration of the salicylate— p-aminobenzoate preparation.

The details of toxicity are presented in Table II. The figures in the brackets indicate the eight patients with gastric discomfort and the 11 with constipation on the high dosage of salicylate (1.0 gm. and 1.3 gm.) in whom the symptoms persisted even when the dose of sodium salicylate was reduced to 0.6 gm.

Discussion

The combination of para-aminobenzoic acid and sodium salicylate is a definite step forward in salicylate therapy for rheumatic diseases. In the present clinical evaluation there was significantly greater relief of pain and stiffness with relatively low doses of this combination as compared to sodium salicylate alone. It is logical to reason that the increase in efficacy is a reflection of: (1) the attainment of higher salicylate blood levels due to the retarding effect of the para-aminobenzoic acid on the urinary excretion of salicylate. (2) the synergistic antirheumatic action of sodium salicylate and sodium para-aminobenzoate. Actually, there was greater comfort produced by doses of sodium salicylate in the form of Pabalate, no larger than the smallest dose of sodium salicylate alone which was employed. Only eight patients (6.4 per cent) required more than two salicylate— p-aminobenzoate tablets every four hours for relief, whereas 40 patients (32.0 per cent) needed more than 0.6 gm. of sodium salicylate.

Table III
Degree of Pain Relief in Rheumatic Diseases Afforded by Sodium Salicylate and Salicylate— p- aminobenzoate Combination

	Degree of Relief							
	Sodium Salicylate				Pabalate			
Rheumatic Condition	1+	2+	3+	4+	1+	2+	3+	4+
Rheumatoid arthritis, peripheral	2	4	10	4	1	1	9	9
Rheumatoid spondylitis	0	1	4	5	0	0	4	6
Rheumatoid peripheral and spinal	0	1	2	2	0	0	1	4
Osteoarthritis	9	15	10	1	7	15	13	0
Cervical osteoarthritis with radicular pain	5	9	1	0	5	8	2	0
Fibrositis	0	3	7	20	0	0	7	23
Chronic painful shoulder	3	4	3	0	0	7	3	0
Totals	19	37	37	32	13	31	39	42
Percentage	15.2%	29.6%	29.6%	25.6%	10.4%	24.8%	31.2%	33.6%

TABLE II
Toxicity

	Number of Patients Affected				
	Sodium Salicylate				Pabalate
	Dose in Grams			Total	Total
Symptom	0.6	1.0	1.3		
Tinnitus	2	3	1	6	0
Deafness	9	2	0	11	0
Gastric Discomfort	16(+8)	6	2	24	0
Nausea	0	1	0	1	0
Vomiting	0	1	0		0
Vertigo	0	1	0		0
Constipation	16(+11)	6(+5)	5	27	0
Totals	62	25	8	69	0
Percentage	49.6%	20%	6.4%	55.2%	0%

It is the opinion of the author that many patients with rheumatic disease develop a habit of multiple nocturia as aching, pain and stiffness develop with inactivity. If one arises during the night the natural thing is to empty the bladder before returning to bed. When the salicylate regimen was replaced by the salicylate—p-aminobenzoate combination, nine patients who formerly arose three times nightly, now arose only once, because with the greater and more prolonged comfort there was less disturbance of sleep.

While the combination of p-aminobenzoate and sodium salicylate proved to be more effective clinically than sodium salicylate and to be well tolerated and free from toxicity or adverse reactions, one inadequacy became evident. This is related to the delay between ingestion and therapeutic response. The patient had no benefit from the medication for three and a half to four hours following the initial dose of the day, unless an extra dose had been taken during the night within five hours of arising time. As pointed out above, this shortcoming was compensated for by administering an enteric coated sodium salicylate tablet with a delayed action (6 to 7 hours) at bed-time or a dose of plain sodium salicylate on arising. The patient can be directed to puncture or chip the enteric coating of the first morning tablet and thus insure rapid absorption and prompt onset of action.

SUMMARY

1. The combination of sodium— p-aminobenzoate with sodium salicylate as compared with plain sodium salicylate has been demonstrated as providing comparable or greater clinical benefit in 125 patients with a variety of rheumatic diseases.

2. The pain relief with this combination was superior to that with sodium salicylate in 65 patients with rheumatoid arthritis and fibrositis. In 60 with osteoarthritis, cervical osteoarthritis with radicular involvement and chronic painful shoulder, the superiority was less marked.

3. The combination gives longer pain relief than sodium salicylate alone.

4. Significant toxic reactions to the combination were not observed. Sodium salicylate produced some toxic effects in 69 (55.2 per cent) of the 125 patients.

5. Twenty-four hour pain relief can be achieved with Pabalate by proper repetition of dosage.

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The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatric Society

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Editorial

THE PEDIATRICIAN AND HIS COMMUNITY

Pediatrics, like all other branches of medicine, has come a long way during the past thirty years. Begun as a specialty concerned chiefly with the nutrition of infants and children, and the management of their acute diseases, it has expanded to take in the fields of growth and development, and concerned itself with the normal and abnormal psychology of children. During the same time, the training of the general practitioner has improved, so that he is well able to manage the feeding of most infants, and the treatment of the acute diseases of children. The pediatrician remains a useful member of the medical family chiefly because of his expanded interests. His training is now as much concerned with the physically well child as with the sick. He learns the normal patterns of physical and mental growth, and the disturbances which occur in them. The influences exerted by the family and the rest of the environment upon the child are included in his consideration.

Because of his orientation, the pediatrician is peculiarly fitted to help the schools and other agencies in his community which are concerned with children. He recognizes that failure in school work, or problems in discipline, indicate a disturbance in the well-being of the child just as surely as a fever or a limp. From his knowledge of growth and development he is able to assess the mental and physical endowment of the child. The emotional background of many types of behavior are familiar to him. He is aware of certain special handicaps which interfere with the educational progress of children without being apparent to the ordinary observer. In many instances, he will require the services of other medical and allied specialists to meet the problems of the individual child. His greatest function is to recognize and interpret the difficulties of the individual, and to call on others with specialized knowledge for help. Any community organization which deals with the problems of children should include a pediatrician.

William J. Ball, M.D., F.A.A.P.
The Northwest Clinic, Minot, No. Dak.

DIPHTHERIA

Immunization against diphtheria has been available almost thirty years. Improvement in biological products and acceptance of their use routinely by the medical profession has brought about a great reduction in the incidence of diphtheria. It is possible for a community to experience no cases and no deaths from this disease. However, that goal is reached too infrequently. Experience with diphtheria in Minneapolis in the past ten years has been:

Year	Cases Resident	Deaths Resident
1949	31	2
1948	27	2
1947	58	1
1946	110	7
1945	64	2
1944	194	3
1943	104	4
1942	25	0
1941	19	1
1940	28	3

Within the first three months of this calendar year there have been 12 resident cases of diphtheria, with two deaths. For the past 15 months our experience has been:

Diphtheria Cases and Deaths in Minneapolis by Age and Immunization Status
January 1, 1949 through March 31, 1950

	Reported Resident Cases		
Age on Report	Total	Number Previously Immunized*	Total Resident Deaths Reported
Total	43	6	4
Under 1 year	0	0	0
1 – 4	10	2	0
5 – 9	12	3	2
10 – 14	3	1	0
15 – 19	1	0	0
20 – 29	3	0	0
30 years and over	14	0	2

*Immunized with at least 2 inoculations.

In reviewing recent cases and deaths, it was found that—

1) in some instances there was delay in diagnosis due to failure of parents to call a physician early in the disease.
2) in some instances parents attempted to obtain the services of a physician early in the disease, but were unable to do so because the physician did not feel the symptoms were sufficiently serious to warrant a house call.
3) in some instances atypical symptoms dulled alertness of parents, and confused physicians.
4) in a few instances symptoms were fulminating in nature and patients died before effective medical treatment could be provided.

Indifference of parents and economic handicaps have contributed to the lack of protection of children through immunization. In the middle 1930s the Health Department had a program with the local medical society for the immunization of individuals unable to pay for the service in the offices of private practicing physicians. For several subsequent years there were no funds available for such a program. A comparatively low incidence prevailed until 1943 and 1944 when 104 and 194 resident cases were reported, respectively. In this latter year a Citizen's Health Action Committee was formed in the community which assumed, as one of its projects, the promotion of adequate diphtheria immunization. Weekly clinics have been sponsored and financed by this group at a minimum fee or without cost to persons unable to pay the fee. This effort has been helpful, but as can be seen in the foregoing tables, cases and deaths are occurring with a history for the majority of no immunization or incomplete immunization. It is indicated now, as it has been in the past, that there is need for the combined efforts of public agencies and private practicing physicians to bring about adequate protection of the community, especially the children, against this disease.

It is important to emphasize the need for booster inoculations. Primary diphtheria inoculations should include preferably three doses, one month apart. It is recommended that the minimum booster inoculation be at least every three years from infancy through age nine.

It has come to the attention of the Health Department that some pediatricians in private practice are recommending that the child be immunized in his first year of life followed by a booster shot at the 15th to 18th month, and then a booster every year until school age; then every three years thereafter to age 12.

Booster inoculations should be given to children previously immunized whenever diphtheria is reported in the immediate neighborhood.

More frequent nose and throat cultures are advised in cases of tonsillitis and nasal obstruction even though no typical membrane can be observed. Reduction of the incidence of diphtheria to a possible no cases and no deaths lies in the continuous and combined efforts of practicing physicians, health departments, and other health agencies.

F. J. Hill, M.D., M.P.H.
Commissioner of Health
Minneapolis, Minnesota

Future Meetings

The sixteenth annual meeting of the American College of Chest Physicians will be held at the St. Francis Hotel, San Francisco, California, June 22 through 25, 1950. An interesting scientific program has been arranged for the meeting.

The next oral and written examinations for Fellowship will be held in San Francisco, June 22, 1950. Candidates for Fellowship in the College who would like to take the examinations should contact the Executive Secretary, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois. Dr. Karl H. Pfuetze, Cannon Falls, serves as the Governor of the College for the State of Minnesota and Dr. John F. Briggs, St. Paul, is the residing president of the Minnesota chapter.

PROGRAM OF NORTH DAKOTA STATE MEDICAL ASSOCIATION

The sixty-third session of the House of Delegates will convene with its headquarters in the Dacotah Hotel, Grand Forks, May 27, at 8:00 P.M., with Dr. A. E. Spear, Dickinson, North Dakota, as speaker of the House of Delegates. Business sessions will continue throughout Sunday. All officers, councillors, and members of the House of Delegates will be housed in the Dacotah Hotel where reservations have already been made.

Dr. W. C. Dailey, general chairman on arrangements, announces that there will be a complete two day scientific program throughout Monday and Tuesday, May 29 and 30, to be held in the Grand Forks high school auditorium. The large technical exhibit will be housed in the recreation room of the Grand Forks high school.

The scientific program as arranged by the committee, composed of Dr. E. A. Haunz, chairman, Dr. R. E. Mahowald, Dr. Charles Graham and Dr. Lloyd Ralston, is as follows:

Monday, May 29

J. S. Lundy, M.D., Mayo Clinic, Rochester, Minnesota—"The Use of Anesthesia in General Practice"

John T. Reynolds, M.D., University of Illinois College of Medicine, Chicago—"Cancer of the Large Bowel"

Nelson W. Barker, M.D., Mayo Clinic, Rochester, Minnesota—"Diagnosis and Treatment of Chronic Occlusive Arterial Disease of the Extremities"

Robert B. Radl, M.D., Bismarck, North Dakota—"Treatment of Medical Emergencies"

Lester R. Dragstedt, M.D., Chicago, Illinois—"Surgical Treatment of Peptic Ulcer"

C. W. Mayo, M.D., Mayo Clinic, Rochester, Minnesota—"Ileitis and Its Surgical Considerations"

Albert Stoesser, M.D., University of Minnesota, Minneapolis, Minnesota—"Respiratory Allergy in Children"

A. K. Johnson, M.D., Williston, North Dakota—"Rh Factor and Transfusions"

Tuesday, May 30

A. E. Culmer, M.D., Grand Forks, North Dakota—"Treatment of Fractures which Reqiure Open Reduction"

L. G Rigler, M.D., Chief, Department of Radiology, University of Minnesota—"Cancer of the Lung"

Presidential Address—W. A. Wright, M.D., President, North Dakota State Medical Association, Williston, North Dakota.

Inaugural Address — L. W. Larson, M.D., President-Elect, North Dakota State Medical Association, Bismarck, North Dakota.

J. D. Cardy, M.D., Professor of Pathology, University of North Dakota School of Medicine, Grand Forks, North Dakota, will conduct a Clinical Pathological Conference

Owen H. Wangensteen, M.D., Chief of the Department of Surgery, University of Minnesota—"The Surgeon's Role in Management of Cancer of the Alimentary Tract"

Lester J. Palmer, M.D., Clinical Professor of Medicine, Washington State University, Seattle, Washington, and President-Elect of the American Diabetic Association—"Application of the Insulins in the Treatment of Diabetes Mellitus with Comments on Diabetes Detection"

D. R. Nichols, M.D., Mayo Clinic, Rochester, Minnesota—"The Use of Antibiotics in General Practice"

William Stafne, M.D., and L. E. Wold, M.D., Fargo, North Dakota—"Diagnosis and Treatment of Common Endocrinologic Disorders"

Leonard A. Lang, M.D., Minneapolis, Minnesota—a subject on gynecology and obstetrics

L. G. Pray, M.D., Fargo, North Dakota—"Poliomyelitis: Diagnosis and Treatment"

The following special societies will also hold meetings: The Pediatric Society and the Ophthalmology and Otolaryngology Society will hold luncheon meetings Monday noon, May 29th. The Society of Obstetricians and Gynecologists and the Radiological Society will hold special luncheon meetings Tuesday.

Dr. E. A. Haunz announces that an organizational meeting will be held Tuesday for the formation of a North Dakota Diabetic Association. Dr. L. J. Palmer, President-Elect of the American Diabetic Association, will be guest speaker.

Book Reviews

Textbook of Pediatrics. Edited by Mitchell and Nelson. 5th edition, 1950. 1658 pages, 426 illustrations, 191 in color. Philadelphia: W. B. Saunders Company. Price, $12.50.

As the editor, Waldo Nelson, professor of pediatrics at Temple University school of medicine, says in the preface to this fifth edition: "The problem of encompassing the various aspects of child care in a single volume is becoming an increasingly difficult one."

A critical review of a textbook of this kind is inevitably colored by the reviewer's background and some of the criticisms and suggestions are, therefore, probably not unanimous among my contemporaries.

I would hold up for adulation the printing and format of the book which are excellent and make for easy reading. Further, the sections on physical growth and development, drug therapy (particularly that concerned with specific therapy of infectious diseases), anesthesia for children, the oral cavity, anemias of infancy and childhood, adolescence, and the excellent tables in the appendix are unsurpassed in any other textbook available at the present time.

On the negative side, some of the sections are not as praiseworthy. In the section on feeding of infants, the calculation of the formula, method of determining how much formula to give the infant and number of feedings is made needlessly complex. The whole problem could have been handled more practically in a few sentences instead of in several pages. I believe also that a definite stand against added carbohydrate in the infant formula should be taken at this time as it is an anachronism.

In the discussion on parenteral fluid therapy, an elaboration of the use of sodium lactate solution in the treatment of acidosis would have been much more helpful than the two or three short sentences devoted to its use.

In the discussion of the common cold, the treatment of which I suppose constitutes 75 per cent or more of our pediatric practice, no mention is made of the use of chemotherapy. In the section which follows on acute pharyngitis the statement is made that "the decision in regard to the systemic administration of one of the sulfonamides or of penicillin should be based upon the general and local severity of the infection and *in particular upon the likelihood or proof that the infection is a bacterial one.*" Very unrealistic, most pediatricians would have to admit.

In spite of these shortcomings, I heartily recommend the book as a text for pediatricians and general practitioners and medical students. R. B. T.

Precis Clinique et Operatoire de Chirurgie Infantile. L. Ombrédanne with the collaboration of M. Fèvre. Mason and Cie, Paris; 1949; 5th edition; pages 1053; illustrations 1026.

With the European hostilities completed and professional circumstances in France stabilized Professor-emeritus Ombrédanne of l' Hôpital des Enfants-Malades in Paris has revised the fifth edition of his clinical and operative text on pediatric surgery. With this edition, Dr. Fèvre, successor to Dr. Ombrédanne as professor of pediatric surgery in Paris, is his collaborator.

The book is set in extremely legible type and is nicely bound. The splendid illustrations are numerous and include photographs, diagrams, line drawings and x-rays. There are no statistics, no tabulated results and few references to the work of others. In essence the text is a compendium of the life experience of a single surgeon in this special field. Needless to say, portions of the book stress conditions not proportional to their importance or frequency of occurrence but in keeping with the material seen by Ombrédanne.

One of the best sections of the book is on diseases of the gastro-intestinal tract. The twenty-two pages on appendicitis are worthy of the attention of any surgeon operating on children. The importance of careful clinical evaluation is emphasized: the examination of the patient tells more of this disease than all the laboratory data in the world. Intussusception is thoroughly discussed: early clinical diagnosis is rightly emphasized as of paramount importance. The reviewer is not in agreement with the authors that irreducible intussusception is uniformly fatal. Pyloric stenosis, foreign bodies in the gastro-intenstinal tract, primary peritonitis, duodenal stenosis are well done. Exposition of Meckel's diverticulum, malrotation, megacolon and atresia of the bile ducts leave something to be desired.

Dr. Fèvre has done much to bring up to date the work on burns, fractures, empyema, and osteomyelitis. Sulfonamide drugs, penicillin and streptomycin are pertinently discussed. Tracheo-esophageal fistulae are superficially mentioned but anomalies of the sternum are elaborated in surprising detail.

The two outstanding deficiencies are information on modern anesthesia for infants and children and on recent developments in congenital cardiac surgery. No mention is made of cyclopropane, pentothal or curare yet chloroform is minutely presented. Nowhere in the book is there a word on patent ductus arteriosus, coarctation of the aorta or "blue baby" surgery.

When one considers the pioneer contributions which Dr. Ombrédanne has made in the only recently developed field of pediatric surgery, reading through this great volume of his personal experiences stimulates one to write "well done." May Fèvre accomplish as much again in his life time. T. C. C.

American College Health Association News

The president of the Association, Irvin W. Sander, M.D., Wayne University, Detroit, spent two days in Chicago in March with the local arrangements committee. The members of this committee are: Leona Yeager, M.D., Northwestern University, chairman; Herbert Ratner, M.D., Loyola University; William Beadenkopf, M.D., University of Chicago; F. C. Lendrum, M.D., University of Illinois; and E. B. Erskine, M.D., ex officio member. A tentative program was drawn up for the annual convention in the spring of 1951. The exact date of the meeting will be anounced later.

* * *

Dr. Sander announces committee chairmen as follows:

Research — Ramona Todd, M.D., University of Minnesota.

Tuberculosis—Max L. Durfee, M.D., Miami University.

Mental health—Dana Farnsworth, M.D., M.I.T.

Administration—Charles Gossage, M.D., University of Toronto.

Environmental health—Walter S. Mangold, B.S., University of California.

Health and physical activities—Ruth M. Collings, M.D., North Carolina University (Women's College).

Health education—A. O. DeWeese, M.D., Kent State University.

Editorial—Edith M. Lindsay, Ed.D., University of California, and Charles E. Shepard, M.D., Palo Alto, California.

Local arrangements—Leona Yeager, M.D., Northwestern University.

Eye health—John D. Schonwald, Miami University.

* * *

At this date, April 11, four local sections have sent in reports that they are holding their annual meetings within the next month. The Illinois section will meet on

April 15 and 16 at DeKalb, Illinois, with Northern Illinois State Teachers College as the host institution. The South Central section will meet on April 29 at Springfield, Missouri.

The twelfth annual meeting of the North Central section will be held at the University of Wisconsin on April 21-22. Dr. John W. Brown, president of this section, and Dr. Ray R. Ruechert, secretary-treasurer, are both on the staff of the University of Wisconsin. The program offers a wide variety of subjects pertinent to student health problems.

The Ohio College Health Association will hold its twenty-sixth annual meeting in Kent, Ohio, on May 5 and 6. Dr. William T. Palchanis, secretary-treasurer, reports that Kent State University was selected as host because it has just completed a new Student Health Service building. Dr. A. O. DeWeese, director of the health service, is chairman of the scientific program and of the committee on arrangements. Miss Rena Coppess, R.N., Wittenberg College, is chairman of the nursing section of the association. Dr. Irvin Sander has been invited to attend the dinner meeting on May 5 to extend a greeting from the National Association.

* * *

Dr. Grace Hiller, Goucher College, was the delegate of this Association at a meeting of the Brookings Institute held in Washington, D. C., in March. The Brookings Institute is planning to survey all types of health and medical services available in this country. College and school health services are a part of the intended study.

* * *

Dr. J. Howard Beard, director of the University of Illinois Health Service and University health officer, died on April 5. Dr. Beard had been in the hospital for about ten days with a heart condition. He had been associated with the University since 1912 and became director of the health service at the time it was inaugurated in 1916.

* * *

Requests are being received from institutions for physicians and nurses to fill vacancies. Letters have also come in from personnel seeking positions. Because of license and requested location, the list of available physicians is not adequate for the existing vacancies. Recent requests have been received from the following:

University of Washington, Seattle—man physician.
Vassar College, Poughkeepsie—woman physician.
University of New Mexico, Albuquerque—man or woman physician.
Wayne University, Detroit—full-time physician.
Eastern Illinois State College, Charleston—man or woman physician who is able to pass the physician examination required by the University Retirement System.
Ohio University, Athens—two internists or general practitioners, preferably with experience in psychiatry or in athletic injuries.
University of Pennsylvania, Philadelphia — full-time physician.
New Jersey College for Women, New Brunswick—nurse between the ages 28 to 35 years.

News Briefs

North Dakota

Dr. Arthur C. Kerkhof, associate professor of medicine at the University of Minnesota, spoke on diagnosis and treatment of cardiac irregularities at the monthly meeting of the Northwest District Medical Society at Minot on March 30.

* * *

Dr. J. G. Vigeland, 74, was named Benson County's "Man of the Half Century" in an exhaustive telephone poll conducted by the Farmers Press. Although age has somewhat slowed the hands that brought over 1200 babies into the world, Dr. Vigeland is as active a diagnostician as ever. He received a state award about 14 months ago that named him the state's outstanding country doctor.

* * *

Dr. J. Terlecki reviewed the history of his native country, a province of the west Ukraine, in a recent address before the Kiwanis club at Devils Lake.

Dr. Terlecki, who served in New Jersey for two and a half years, is taking indoctrination training at the Mercy hospital as resident physician and later will practice at Minnewaukan.

* * *

Dr. and Mrs. J. J. Korwin and Dr. and Mrs. C. M. Lund of Williston left Saturday, March 4, for New Orleans to attend the Graduate Medical Assembly for a week, beginning March 6. After the meeting Dr. and Mrs. Lund continued on the Post Medical Assembly Tour of the West Indies.

New Locations and Appointments . . .

Dr. Omar Dekker, formerly of Findley, is newly established at the Community Clinic building in Hope, North Dakota.

* * *

Dr. Graham A. Kernwein, chief orthopedic surgeon at Northwest Clinic in Minot, is entering private practice in Rockford, Illinois. Dr. Kernwein, who has headed the orthopedic department since May, 1946, will also be on the staff of the Rockford hospital.

* * *

Dr. A. Martens has recently moved to Killdeer, North Dakota, and will establish a practice in that community.

Minnesota

Rochester's new public health center opened the latter part of March. One of the few complete public health centers in the country, it houses under one roof all departments of the Rochester-Olmsted county health unit.

Construction of the center was begun almost a year ago. It was financed by $150,000 from the Mayo association, $30,000 appropriated by the city and a $90,000 federal grant.

DR. WALTER ALVAREZ of the Mayo clinic, Rochester, Minnesota, has been named editor of G.P., official magazine of the American Academy of General Practice, to succeed Dr. F. Kenneth Albrecht, who died recently from injuries suffered in an automobile accident.

* * *

CANCER RESEARCH FUNDS totaling $61,071 have been granted the University of Minnesota for the year beginning July 1. Among the grants is one of $7,000 to the university to finance work in cancer biology by Dr. Robert A. Huseby, who is working in collaboration with Dr. John J. Bittner, professor of physiology, and Dr. Cyrus Barnum, associate professor of physiological chemistry.

Other researchers, and the amounts granted to finance their work, are: Dr. Arthur Kirschbaum, associate professor of anatomy, $4,725; Dr. Nathan Lifson, physiology professor, $8,140; Dr. S. C. Reed, associate professor of zoology, $6,925, and Dr. Maurice B. Visscher, head of the department of physiology, $3,250. Fellowship grants of $4,250 were also made to Dr. Truman A. Newberry, and $4,500 to Dr. Lee W. Wattenberg.

* * *

DR. A. M. WATSON of Royalton was one of the chief "defense" witnesses when the people of Morrison county, Minnesota, recently went "on trial" for not doing all they could to improve public health in their own communities. There were 21 witnesses in all, at the mock trial held in the County Court House at Little Falls. The trial was planned by the county nursing service, with help from the district and state offices of the Minnesota Department of Health.

* * *

THE WORK of Dr. Suad A. Niazi, medical fellow in surgery at the University of Minnesota, is described in "Blueprint for Understanding," the recently published 30-year review of the Institute of International Education, New York. In 1947, Dr. Niazi, a physician in the Royal Medical college in Gaghdad, Iraq, came to the University of Minnesota medical school under a state department fellowship.

Elections . . .

Dr. Silas C. Anderson was elected chief of staff at the annual meeting in March of the medical staff of Fairview hospital. Other new officers are Dr. Myron Lysne, vice chief of staff; Dr. Louis J. Roberts, secretary; Dr. Glenn L. Peterson, treasurer; executive committee, Drs. J. C. Giere, R. T. Soderlind and John Moe.

Dr. Owen F. Robbins is the newly elected president of the Minneapolis Academy of Medicine. Other officers re-elected include Dr. John Moe, vice president; Dr. John A. Haugen, secretary; Dr. Karl E. Sandt, treasurer, and Dr. Donald C. MacKinnon, recorder.

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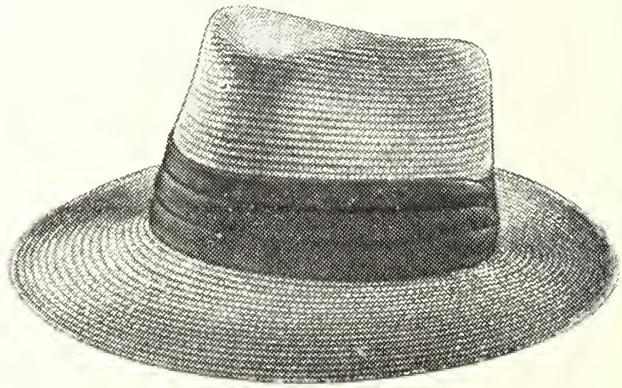

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The JOURNAL LANCET

JUNE, 1950 Volume LXX, No. 6

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

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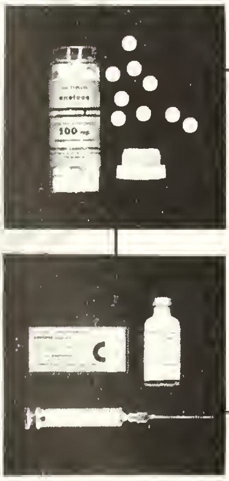

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The JOURNAL LANCET

Minneapolis, Minnesota
June, 1950

Vol. LXX, No. 6
New Series

Gynecologic Conditions Requiring Emergency Surgical Treatment

Joseph Hyde Pratt, M.D.*
Rochester, Minnesota

A DISCUSSION of emergency gynecologic procedures always brings a problem of reducing the material to fit the time and of trying to keep it interesting to a group composed of general practitioners and surgeons. Since the diagnostic features are a common ground to both, I will try to cover some of the points that are helpful in gynecologic diagnosis. As Carrington[1] pointed out in 1945, we physicians cannot hope to make a correct preoperative diagnosis in 100 per cent of the cases of acute conditions, but we can try. He showed in an analysis of more than 1,932 emergency procedures on females that the 29 per cent errors in preoperative diagnosis were not errors that were due primarily to the atypicalness of the condition, but were errors of omission and oversight.

APPENDICITIS

Since appendicitis requires emergency surgical procedures more frequently than any other condition, and since it has to be considered in the differential diagnosis of gynecologic conditions, I shall mention it briefly. Appendicitis is the most important entity which needs emergency treatment, although nowadays with chemotherapy available the loss of life due to appendicitis has been remarkably reduced. In Carrington's series the appendix was the source of the trouble in 950 of the 1,932 cases and the diagnosis was made correctly in 80 per cent of these 950 cases. When the classical syndrome of pain in the epigastrium, nausea and vomiting, shift of pain to right lower quadrant of the abdomen, leukocytosis and fever of low grade is present, the diagnosis can hardly be overlooked as this is pathognomonic of appendicitis. When nausea or vomiting initiates the illness, or it starts with malaise, upper respiratory infection or the like, one must be careful as appendicitis almost always starts with abdominal pain. Since the treatment of appendicitis is still early surgical excision of the inflamed organ, some needless operations will be performed, and some patients with mesenteric adenitis will lose their appendices.

Sappington and Horneff[2] reported the results of the pathologic examination of 937 appendices removed at operation for acute appendicitis, not appendices removed in the course of other operations. They found: acute appendicitis in only 29.5 per cent; subacute appendicitis in 4.6 per cent; chronic appendicitis in 1.9 per cent; appendicitis obliterans in 3.7 per cent and 60.3 per cent negative or normal appendices.

With these findings in mind it seems that if the operations for acute appendicitis in a general hospital reveal acute appendicitis, on pathologic examination, 75 per cent of the time, then the surgeons and diagnosticians are giving the patients excellent consideration.

---

*Division of Surgery, Mayo Clinic, Rochester, Minnesota.

RUPTURED ENDOMETRIAL CYSTS

Endometriosis was the underlying disease in 77 of Carrington's[1] cases and the preoperative diagnosis was made correctly in only 12 cases, an accuracy of 16 per cent. When endometriosis gives rise to symptoms of acute abdominal distress the symptoms usually are due to the rupture of a thin-walled endometrioma of an ovary. Such cysts are adherent to adjacent organs, are not liable to twist, but may leak or frankly perforate because of their thin walls. The symptoms depend on the suddenness and amount of the spillage and the symptoms are severe enough so that the patients tend to seek medical advice within a period of a few hours after onset. At the Mayo Clinic we have encountered nine of these cases in the last several years. All of the nine patients were admitted within twenty-four hours of the onset of symptoms, and the admitting note usually read: "patient having considerable abdominal pain, but pulse, temperature and respiration normal"; "marked abdominal discomfort, patient seems in good shape"; "severe abdominal pain, no shock or evidence of vascular collapse" and the like. In other words, the patients were having rather severe abdominal pain but did not appear in serious distress or too ill.

The ages of these patients varied from the early twenties to the middle forties, but the majority were young women. Only one of the nine had been pregnant. The correct diagnosis was made before operation in three of the nine cases. When we went back over the records we found that in several the story of rather severe dysmenorrhea had been noted in passing, but no further attention had been accorded to it. The physical findings were not as conclusive as one would wish and the rectovaginal findings were seldom definite enough to serve as the basis for the diagnosis of endometriosis. The patient generally went to operation with a diagnosis of appendicitis, ectopic pregnancy, or merely acute abdominal condition requiring emergency treatment. However, when a patient presents herself because of abdominal pain that has come on suddenly, is in moderate distress but in fair-to-good physical condition and gives a history of poor fertility plus marked or progressive dysmenorrhea, the diagnosis of ruptured endometrioma must certainly be considered. The physical findings of tender nodular uterosacral ligaments with perhaps a puckered scar or bluish cyst in the vaginal vault are confirmatory signs pointing to the diagnosis. The lack of localized tenderness or the lack of a history of pregnancy, and the lack of a disturbance of the menstrual cycle point away from a diagnosis of appendicitis or ectopic pregnancy.

RUPTURED ECTOPIC PREGNANCY

Ruptured ectopic pregnancy forms a large percentage of the operative gynecologic emergencies, although of all the total admissons to any hospital, patients who have acute inflammatory conditions of the pelvis are the largest group next to those who have appendicitis. However, ectopic pregnancy is the "killer of the emergencies" and the one in which early diagnosis and treatment may save the patient's life. With greater emphasis on the diagnosis, prompt surgical treatment and replacement of the loss of blood, the mortality rate has dropped from 80 per cent in the latter half of the nineteenth century to five to ten per cent from 1925 to 1930 and now in most hospitals is about one or two per cent. Williams and Corbit[3] found 101 deaths in 2,204 ectopic pregnancies in Philadelphia, a mortality rate of 4.6 per cent from 1931 to 1943. In the last two years of this study it was two per cent. In this group of 101 cases, 36 died without operation, primarily errors in diagnosis causing such delays that the patients never reached the operating room. Thirty-five of the remaining were in shock and 26 of these 35 died from hemorrhage and seven from infection. Thirty were in reasonably good shape but of these, five died of hemorrhage and ten of infection. In half of these 30 cases the appendix was removed at the time of the operation for the ectopic pregnancy in spite of the presence of an excellent culture medium. Ectopic pregnancy occurs about once in every 300 pregnancies, occurs more often in multiparous than in primiparous patients, and because of the added incidence of tubal infections is more frequent in the colored than in the white race.

The patient is brought to the hospital with the story of a sudden abdominal pain, frequently severe enough to make her cry out or faint. The pain is unilateral at first but quickly becomes generalized over the lower part of the abdomen and is continuous though not as severe as at first. The abdomen of such a patient is exquisitely tender to palpation as well as to jars or disturbances. The patient is restless rather than immobile as seen with the patient who has a perforated ulcer. Air hunger gives a much better indication of the severity of the hemorrhage than does the blood count. The patient is pale, has signs of shock with rapid, thready pulse and low blood pressure. The blood pressure depends on the amount of shock. One excellent sign that is often present is shoulder pain resulting from the irritation from the blood on the under surface of the diaphragm. This sign practically cinches the diagnosis.

The history is important in two details, first the possibility of pregnancy, the confirmation of which may depend on the marital status of the patient. Though in such situations the seriousness of the condition is self-evident and most patients are willing to give any information that will help in the diagnosis. Secondly, a change in the periods, not amenorrhea, but a scanty, delayed or abnormal period, following which the patients generally pass small amounts of dark blood from time to time or continue to have daily spotting.

Physical examination reveals a patient in abdominal distress with the signs of shock which are dependent on the acuteness and amount of bleeding present. The abdomen is tender throughout, but the lower part is most markedly tender. Spasm of the abdominal muscles is not a feature but the rebound tenderness is so bad that if the examiner is rough or moves suddenly he will elicit all kinds of protective voluntary spasms.

Rectovaginal examination invariably reveals a cervix and uterus that are extremely sensitive to all motions. Tenderness also may or may not be more marked in one adnexa than the other. The cul-de-sac generally is boggy and a mass can be often palpated in the cul-de-sac or adnexal areas.

Above all, physicians must watch out for the unusual; just because there is placental tissue in the vagina, they must not overlook signs of intra-abdominal hemorrhage and shock. The patient may have two simultaneous pregnancies and one of them may be an ectopic one. The treatment of course is surgical and should be done at once.

RUPTURED CORPUS LUTEUM OR FOLLICULAR CYST

Ruptured corpus luteum or follicular cyst is the next most frequently seen gynecologic condition which requires emergency surgical treatment. This is the typical mittelschmerz syndrome. McSweeney and Wood[4] reported from the Massachusetts General Hospital that every thirteenth operation for acute appendicitis was due to a ruptured cyst. Patients who have ruptured corpus luteum or follicular cysts are uniformly young, less than 25 years of age, and most often are unmarried. The majority give a history of similar previous attacks that may alternate sides each month. For this reason surgeons are cautioned not to take out an ovary for a ruptured or bleeding follicular or corpus luteum cyst. Within a month or two the same syndrome may appear on the opposite side and the girl has already lost one ovary. The bleeding can always be controlled with simple mattress sutures, though at times it is necessary to trim down the size of the cyst walls. The pain with these attacks comes on suddenly, is at a maximum at the beginning, gradually subsides over a period of hours and starts in one lower quadrant or the other. Symptoms referable to the gastro-intestinal tract tend to be absent and leukocytosis is not marked.

Physical examination is remarkable for its lack of pertinent findings. The localization, a point of maximal tenderness, rebound tenderness, and spasm of typical appendicitis are just not present. The lower part of the abdomen is tender, but there is no spasm or localization. Rectovaginal examination often reveals tenderness in the affected side on motion of the cervix or pressure over the adnexa. Observation for a few hours is ordinarily sufficient, but if localizing signs are present, or if the symptoms are becoming more severe or if signs of hemorrhage appear, exploration should be carried out. In these cases the signs and symptoms differ primarily from those due to a slow bleeding ectopic pregnancy in that the menstrual history is normal, vaginal bleeding is absent and often pregnancy could not have occurred.

SALPINGITIS

Salpingitis is one of the most frequently encountered emergency gynecologic conditions, but with the chemotherapeutic agents available today, the surgeons see only those patients whose condition resembles acute appendicitis or those who have secondary complications, such as abscesses or inflammatory residuals. The acute salpingitis, pyosalpinx, "hot tube," or whatever it is called, is not often seen in patients who are more than 40 years of age. Salpingitis usually follows some pelvic insult in the form of pregnancy, menses, alcoholic or sexual excesses. The attacks start with malaise, fever and low abdominal pain. The pain is not well localized on one side or the other. The presence of neisserian bacteria from the cervix, acute bartholinitis or vaginitis is confirmatory evidence. The temperature is elevated; it is more likely to be more than 101° than less than 101° F.; the patients usually look sick. General physical examination may confirm the presence of infection in the vaginal tract or the cervix while bimanual examination reveals the tenderness on motion of the cervix that is bilateral and possibly enlargement of one or both tubal areas. The most helpful laboratory aid is the sedimentation rate as it is elevated in 100 per cent of the cases of salpingitis while in the majority of the cases of early acute appendicitis it is within normal limits.

TWISTED OVARIAN CYSTS

Twisted ovarian cysts are the final entity I would like to mention and interestingly enough, though these cysts are palpable when zealously sought, in 95 per cent of cases, the percentage of accurate diagnosis in Carrington's series was only about 50 per cent. Twisted ovarian cysts may occur among patients of any age from childhood to old age. The onset is sudden in any given attack as the pain starts with the torsion of the pedicle, however, many of the patients will say they have had similar minor episodes in the past. The temperature and leukocyte count do not rise as in the inflammatory conditions. If the torsion is such as to produce permanent or gangrenous changes, the pains will become severe and continuous. Physical examination gives negative results except for the pelvic findings, and as mentioned before, the cysts should be palpable in 95 or more per cent of the cases. The lack of signs of a localized inflammatory condition exclude appendicitis from consideration. Shock is never as severe as that seen in ectopic pregnancy and there are no signs of internal hemorrhage as in the latter. A helpful sign that may be elicited is the referral of pain from the ovary to the thigh of the affected side. Roentgenograms may be helpful as many of these cysts are dermoids and areas of calcification may show in the roentgenogram. Again the treatment is surgical with exploration of both ovaries as many cysts tend to be bilateral and a similar although smaller cyst is often present in the opposite ovary.

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Paracervical Block Anesthesia During Labor[*]

John S. Gillam, M.D.[†] and Donald W. Freeman, M.D.
Minneapolis, Minnesota

Local anesthesia has many well-recognized advantages over systemically acting analgesic drugs and anesthetics in obstetrics. Chief among these is the nearly complete safety afforded mother and baby. While local anesthesia is being widely used for obstetrical deliveries and for numerous gynecologic procedures, its use in the relief of the pain of uterine contractions during labor has been limited. This is in spite of the fact that interruption of the uterine nerve supply by paracervical (parametrial) block is a simple procedure because of the nature of the uterine innervation.

The uterine innervation is all from the autonomic system. Both sensory and motor pathways reach it by way of the utero-vaginal plexus. This plexus, also known as the pelvic plexus and including Frankenhauser's ganglion, is made up of a network of fine fibers and ganglia measuring about 2x3 cms. It lies extraperitoneally in the base of the broad ligament just above the uterovaginal junction, lateral and slightly posterior to the isthmus of the uterus. Blocking this plexus with local anesthetics blocks all pain sensation from the uterus.

Rosenfeld,[1] in a review of literature up to 1945, found only three reports on the use of paracervical injections of local anesthetics during labor. He reported at that time on his experience with the method in 100 patients. Immediate complete relief of pain was obtained in each instance. Except for a transient drop in blood pressure in one patient and a temporary slowing of the fetal heart rate in two instances, no untoward effects were noted. Rosenfeld used procaine, nupercaine and eucupin in varying concentrations, both with and without added adrenalin. Relief of pain lasted from one-half hour to four hours with the longest duration of effect being obtained when nupercaine or eucupin was used with added adrenalin.

The results to be described deal with observations of the effects of 69 blocks done on 59 patients at the University of Minnesota Hospitals. Thirty-nine of the patients were multiparas and twenty were primiparas. Slightly more than one-half were private patients and the remainder "house cases." There were eight premature births. Two patients were in false labor. The other 49 patients delivered approximately at term. Slightly more than one-half of the patients had complications of one sort or another which preceded or complicated labor. Two had small areas of premature separation of the placenta. Five patients had a significant anemia. Seven had urinary tract infections. Two had heart disease. One had diabetes. The remaining complications included varicose veins, primary uterine inertia, and prolonged labor.

The block is readily carried out at any time during the first stage of labor. The injection is greatly facilitated by the use of a guide (figure 1). This consists of a long spinal needle of a larger bore than the needle through which the agent is injected. It is carried up to the junction of the cervix and vagina with two fingers of one hand and with the proximal end up. The needle on the syringe is then threaded through the guide and the injection made. The needles are selected for length so that the injecting needle projects approximately 1½ cm. beyond the guide. This increases the safety of the procedure by limiting the depth of the injection. The usual technique for sterile vaginal examination is used. Sterile gloves are worn. The field is draped with sterile towels. A quantity of aqueous zephiran 1-1000 is instilled into the vagina prior to injection. The injections are made on each side slightly posterior to the 3 and 9 o'clock positions. In our series 20 cc. of the anesthetic agent was used on each side in the majority of cases, and the drug used in all except three cases was 1 per cent procaine. One and one-half per cent metycaine was used twice and .15 per cent pontocaine once. Adrenalin was added to the solution in all but 13 instances. The concentration varied from 1 to 3 minims of 1-1000 solution per ounce of anesthetic agent.

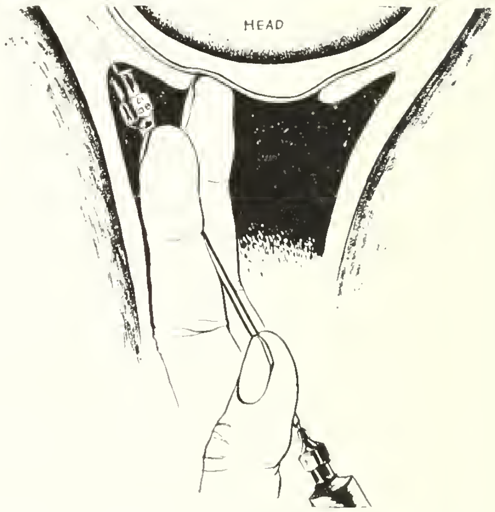

Fig. 1. Technique for paracervical block during labor.

Results

The degree of pain relief obtained is summarized in Table I. Four blocks were total failures and an additional patient got relief of pain on only one side, the block on the other side having failed. Twelve patients got complete relief of abdominal pain but were left with minor back discomfort. We have learned that many of these can be relieved by an additional injection of about 10 cc. on each side more posteriorly into the sacrouterine ligament area. This was tried in seven instances and the backache was relieved in five. Fifty-two of the blocks were completely successful in that all the discomfort disappeared for the duration of the effect. The onset of pain relief in each instance was immediate.

---

[*] Department of Obstetrics and Gynecology, University of Minnesota Medical School.

[†] Now at Fargo Clinic, Fargo, North Dakota.

Table I
Pain Relief

	No.	Percent	
None	4	5.8	
One side	1	1.4	
			7.2
+++ (minor residual backache)	12	17.4	
Complete	52	75.4	
			92.8
Total	69	100.0	
Uterosacral block for residual backache	7		
Backache relieved	5		

The duration of pain relief is summarized in Table II. In approximately three-fourths of the patients the duration exceeded 1½ hours when delivery did not occur before the block wore off. No conclusions can be drawn from this study as to the effect of adrenalin in the anesthetic solution on the duration of effect since there were only five blocks done without added adrenalin in patients in whom delivery did not intervene and duration could be measured. Similarly, no valid conclusions can be drawn concerning the effect of the amount of the agent used on the duration since in only seven instances was more than 40 cc. injected. In four of these seven cases, the duration could be measured and in all four the effect lasted over two hours. In two cases 60 cc. was injected and both blocks lasted 2½ hours. In this connection it may be noted that Rosenfeld found that the duration of effect was lengthened when more than 50 cc. of the anesthetic was used.

Table II
Duration of Pain Relief

Block wore off before delivery		Delivery intervened	
Failed	4	Less than 1½ hours	19
Less than 1½ hours	7	1½ to 2 hours	5
1½ to 2 hours	12	2 to 2½ hours	4
2 to 2½ hours	16		—
Over 2½ hours	2	Total	28
Total	41		
Average duration: 1 hour 40 minutes		Average duration: 1 hour 10 minutes	

At the present time 1½ per cent metycaine solution is being used instead of procaine in the hope of increasing the duration of action. The dosage is also being increased. The longer acting anesthetic agents such as nupercaine have not been used because of their greater toxicity.

The use of additional analgesia and anesthesia is summarized in Table III. Most of the patients were injected only once, and since the average duration of effect was only one hour and forty minutes, and since twenty of the patients were primiparas, it is not surprising that a considerable number required added analgesia. However, slightly more than one-half of the patients did not require any further sedation during labor. Paracervical anesthesia has no effect on the pain associated with distension of the vagina and vulva during delivery. Consequently, additional anesthesia was required for delivery in most instances. In 53 patients local pudendal blocks were used and 21 were also given small quantities of nitrous oxide and oxygen by inhalation. More than a third of the patients went through the entire labor and delivery with only local anesthesia in the form of paracervical and pudendal blocks.

Table III
Added Analgesia and Anesthesia

	No.	Pct.
Analgesia		
None	30	52.6
Demerol pre-block only	13	22.6
Demerol post-block only	5	8.8
Demerol pre- and post-block	9	15.8
Delivery analgesia		
Pudendal block	53	93.0
N_2O - O_2	21	37.0
Local only (no Demerol or N_2O)	21	37.0

A transient uterine inertia lasting 15 to 20 minutes was commonly observed immediately following the injection. The same effect almost regularly follows pudendal block if the anesthetic agent contains adrenalin. This effect is believed to be due to adrenalin. The general impression was obtained that the blocks frequently increased the speed of cervical dilatation despite the temporary slowing effect noted above. The effect of any agent on the duration of labor is very difficult to evaluate because of the many different factors concerned with the progress of labor. Nevertheless, in seven instances of slow labor, the operators were enough impressed by the effect of the blocks on the course of labor to make comments on the charts to the effect that cervical dilatation was definitely speeded up after the injections. On the other hand, in two instances of real primary uterine inertia, the blocks showed no noticeable effect on the rate of progress.

In no case was it felt that the blocks significantly slowed the progress of labor.

All but nine of the patients delivered spontaneously. The remainder were delivered by forceps extraction. In no case did interference with the mechanism of labor by the blocks play any part in the indication for forceps.

There were no maternal or infant deaths in the series. There were no significant untoward effects on the mothers (Table IV). There were no puerperal infections. One patient was found to have a minor thickening in the parametrial region on one side at the time of discharge from the hospital. It was thought possible that this represented a small hematoma.

TABLE IV

Untoward Effects

	No.	Pct.
Maternal		
Temporary paresis of thigh adductors	4	5.8
Adrenalin reactions (tachycardia, B.P. rise, etc.)	4	5.8
Fetal		
Depression of heart tones	4	5.8
Temporary	2	
Asphyxiated at delivery	2	
True knot in cord	1	
Premature separation placenta	1	

The blocks were associated with a depression of the fetal heart rate on four occasions. Two of these infants were somewhat asphyxiated at birth, but in neither case was it felt that the block played a part (Table IV). The cause of the depression of the fetal heart rate is not apparent. Rosenfeld noted its occurrence twice in his series. In each case it proved to be transient and the infants were both normal at birth.

Table V shows the frequency with which fetal asphyxia occurred. In no case did the paracervical blocks play a part.

DISCUSSION

Paracervical anesthesia has the advantages, in general, of all local anesthetics. It is apparently nearly completely safe for mother and baby. The technique is easy and it can be done by anyone on almost any patient. There are no post-delivery reactions and no pulmonary or general complications are to be expected. There is no interference with the normal process of labor and delivery and no interference with the establishment of respirations in the infant. At the same time the degree of pain relief obtained is complete or very nearly complete in the great majority of cases.

TABLE V

Asphyxia

	No.	Pct.
None	50	87.7
Asphyxia	7	12.3
Asphyxia due to block	0	
Asphyxia		
Mild	4	
Trauma (ppt. labor)	1	
Resp. obstruction	2	
Premat. sep. placenta	1	
Moderate	2	
True knot in cord	1	
Trauma (mid forceps)	1	
Severe	1	
Premature separation placenta	1	

The chief limiting factors in the general application of the method are the relatively short duration of effect and the rather bothersome procedure involved in carrying out the injection under sterile conditions. The method should prove useful particularly in patients with short labors and in patients with special contraindications to the use of generally acting analgesic drugs, as for example in premature labors.

SUMMARY

1. The effects of 69 paracervical injections of local anesthetics during labor are described.

2. Complete relief of pain was obtained in 75 per cent of the patients. An additional 17 per cent obtained nearly complete relief.

3. The average duration of effect in the patients who did not deliver before the block wore off was 1 hour and 40 minutes.

4. No significant untoward effects were noted.

REFERENCES

1. Rosenfeld, Samuel S.: Paracervical anesthesia for the relief of labor pains. Am. J. Obst. and Gyn. 50:527, 1945.

TOTAL SYNTHESIS OF ESTRONE

The first total synthesis in the United States of the female hormone estrone has been accomplished by University of Wisconsin chemists. The synthetic duplicate of natural estrone was developed from easily obtainable coal tar products after four years of laboratory experiments, according to Dr. W. S. Johnson, who headed the research. At the present time, estrone is obtained by extracting the hormone from the urine of pregnant mares, or by chemical conversion of closely related substances such as cholesterol.

"At the present time our process is not practical for any large scale production," Dr. Johnson cautions. "However, after further research and refinement, such a process may help make estrone more readily available at lower cost to the nation's hospitals."

The True Toxemias of Pregnancy

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The true toxemias of pregnancy are diseases caused by cell substances from the products of conception, cell substances not possessed by the cells of the mother, and which are toxic to her cells. These cell substances are inherited by the child from the father.

Among these cell substances are the organic compounds that are involved in the well-known phenomenon of blood incompatibility: the O, A, B, and Rh substances, and likely some yet unknown substances that must be assumed to be present, at times, to account for irregular incompatibility.

If one understands how cell substances of certain bacteria cause disease, how the bacteria are eventually killed and the disease cured by the generation of a specific antitoxin by the host, or by the administration of a processed specific antitoxin; and if one understands the causation of disease manifestations by cell substances in the venom of snakes, and the cure of these manifestations by specific antitoxins either actively generated by the host or administered artificially, he can visualize quickly and clearly how intraspecies cell substances coming from the parasitic fetus, through breaks in the placental barrier, cause the true toxemias of pregnancy, the cure being furthered by the active generation of specific antitoxins by the mother or host.

This understanding demands that we reassess our traditional serologic views as to the significance of the components of human blood, namely, the cell substances, agglutinogens, isoagglutinins, isohemolysins, and isohemotropins; reassess these traditional concepts from the standpoint of how these serologic elements have always functioned in nature, according to verifiable obstetric, serologic and experimental observations, and not alone from the traditional standpoint, based entirely upon what takes place when human bloods are mixed on a slide, or in gross transfusion, two absolutely unnatural happenings.

If one could trace the cell substance content found in the blood of the human species in our infinitesimal segment of evolutionary time, back to whatever primordial blobs of living organic matter the species took its origin, possibly one billion and a half years ago, he would likely find that various cell substances have been added and dropped out, through the conjugation of various different cell substance stocks, at various levels of the phylogenetic tree. The result of each mating or mixture of stocks, as regards the cell substance inheritance of the progeny, was determined, as today, by Mendelian law. It is a reasoned belief that when the progenitors of the human species evolved to a placental mechanism, possibly fifty million years ago, the offspring continued to inherit its maternal or paternal cell substances in accordance with Mendelian law, but, if the offspring inherited cell substances of the sire that were poisonous or toxic to the cells of the mother, a toxin antitoxin relationship was established between fetus and mother, if these toxic cell substances could gain access to the maternal circulation through breaks in the placental barrier. The life or future well-being of the mother then depended upon whether or not her cells could actively generate antitoxic substances specific to these toxins and capable of adequately protecting her, or whether or not parturition would supervene to separate the toxic offspring from the mother before the cells and organs of the mother had suffered irreparable damage. The child's life, or well-being, depended upon the strength of the maternal antitoxin, or the separation of the child from the mother before the cells of the child were irreparably damaged by the maternal antitoxin. This toxin antitoxin battle, from scratch as it were, can be witnessed today, where the Rh substance is involved. The traditional concept maintains that the appearance of the anti-Rh isoagglutinin is only an antibody reaction to the Rh agglutinogen, whereas, in point of fact, an anti-Rh antitoxin is generated, an antitoxin containing not only a specific isoagglutinin, according to traditional parlance, but an equally specific lysin and an equally specific hemotropin or opsonin. The transfused red cells containing this relatively toxic cell substance are found to be not only injured by the lysin of the antitoxin, as evidenced by the agglutination and the hemolysis, but phagocytosed by the leucocytes of the host, under the seasoning of the opsonic arm of the antitoxin. It should be stressed here, that if one prefers to consider agglutination as being a manifestation of the supposititious action of the isoagglutinin upon the agglutinogen, rather than as a manifestation resulting from injury to the red cells, he must consider the isoagglutinin as a functional arm of the antitoxin, and the agglutinogen as being only another name for the antigenic cell substance involved. It is the relatively toxic cell substance in the red cells and serum of the fetus that is injuring the maternal cells and thereby causing the formation of the specific antitoxin. If one recognizes this, and then wishes to call the cell substance involved an agglutinogen because of its relationship to the manifestation of red cell agglutination, the issue is not confused. From the standpoint of the disease under discussion, the main factors involved are the cell substances causing the disease, and the defending specific antitoxins.

It is obvious that in nature the mixture of bloods of different individuals has never taken place except in the parasitic relationship between fetus and mother. Now, given the production of specific antitoxins against the cell substance involved, or the presence of evolved complements of inherited antitoxins, it is likewise obvious that the unnatural transfusion of red cells containing these toxic substances would result in the phenomenon of incompatibility. Incompatibility stems from the fact that the transfused blood is actually poisonous or toxic to the cells of the individual to which it is incompatible, and it is then incompatible only if the serum of the latter individual contains either actively generated or inherited antitoxins specific to the cell substances involved.

Though it seems quite certain that incompatible blood kills the recipient quickly because of the mechanical effects of agglutination, it is likely that death is accelerated by the toxic effects of large quantities of the transfused blood, which, if the agglutination could be obviated, and the blood given over long periods of time, would produce, in the male and female alike, pathology identical with that found in the true toxemias of pregnancy. This basic similarity in pathology has been glimpsed at autopsies in delayed transfusion deaths. In nature, as a rule, fetal serum and red blood cells containing the involved toxic substance or substances gain access to the maternal circulation in repeated infinitesimal amounts over comparatively long periods of time, and the mother shows the pathology caused by the toxic substance or substances without having the pathology concealed by gross agglutination and hemolysis. In nature, the antitoxin has functioned as a protection to the mother and now may spell her doom only if gross transfusions of toxic blood are given, or if there are large breaks in the placental barrier.

It should be constantly remembered that our traditional understanding of the serologic components in human bloods has been based upon phenomena witnessed in the unnatural mixture of bloods. We have learned our serology in reverse, as it were. Traditional understanding has maintained that though we know that isoagglutinins, isohemolysins and isohemotropins exist, paralleling each other in specificity and tending to parallel each other in strength, yet the physiological function of these entities and their biological significance are not known. Obstetric research in the true toxemias of pregnancy seems to show clearly that they function as a protection to the pregnant woman and must have played a great biological role in survival findings and in determining the relative percentages of the different blood groups, etc., as we find them today.

Thus, for possibly fifty million years, the stage for this toxin-antitoxin battle has been set whenever the cells of the products of conception inherited from the male, cell substances toxic to the cells of his mate. When the first A cell substance male impregnated an O cell substance woman with an A child, it seems logical to suppose that this O stock woman did not possess a complement of inherited anti-A and anti-B antitoxin. In this respect she was like the Rh negative woman, who, to date, has not inherited a complement of anti-Rh antitoxin. Findings make it seem reasonable to postulate, that after eons of evolutionary time, in response to the survival interests of the mother and of the species, each type of blood began to inherit a protective complement of specific antitoxic substances against the cell substances that had been toxic to its cells for ages. That it took eons of evolutionary time to bring this about would seem clear from the findings of ontogeny. The A and B substances reach a strength which permits their demonstration in the fetus around the 37th day of gestation, and yet the protective antitoxin complements against these substances, using the O cell substance individual as an example, do not appear until an indefinite period after the 280th day. This fact lends itself to the logical interpretation that the composition of the blood groups as we see them today, as regards complements of inherited antitoxins, differs from their composition in the past, if we can place any confidence in the lessons to be drawn from ontogeny. Before these inherited antitoxins appeared, it is reasonable to assume that blood incompatibility would not have existed except in cases where the mother had been immunized by pregnancy, or in cases where individuals had been immunized by transfusion, as is the case today as regards the Rh negative individuals.

When the blood groups were discovered, the component parts of each deduced, and the mechanism of agglutination and incompatibility described, there was not the slightest suspicion that all elements other than the cell substances, which were then designated as agglutinogens, arose from a toxin-antitoxin mechanism between fetus and mother that had existed since the placentate evolution of the origins of the species. The differences were looked upon as we look upon other structural differences. That the blood of one individual of the human species could be actually toxic to another individual of the species, or that a child could be toxic to its mother, due to differences in structural cell substances, in the sense that was known to exist between cell substances of certain bacteria and certain snakes, and humans, was not dreamed of in our philosophy. True, Veit, in 1902, suggested the syncytiolysin theory of toxemia causation, and Dienst, in 1905, suggested fetal blood incompatibility as the possible cause of toxemia. Veit's theory did not lend itself to adequate proof, and in the theory of Dienst, the injury was deemed to arise from the mechanical effects of agglutination, as was the concept in gross blood transfusion. That incompatible blood was actually poisonous to the cells of the recipient, whether the blood came from the fetus or from a donor, was not imagined. As far back as 1910 it had been clearly demonstrated that transfused incompatible blood was not only agglutinated but hemolyzed and phagocytosed by the leucocytes of the host, phenomena analogously paralleling those found when bacteria, containing a toxic cell substance, are attacked by a specific antitoxin in a host. When it came to blood work, however, we kept on maintaining that when we witnessed agglutination of red blood cells under such conditions, we were witnessing the mere action of a specific isoagglutinin on its agglutinogen, and not the action of a specific antitoxin on red cells containing the specific toxic substance involved. Such was the weight and force of tradition that it took thirty years before our error suggested itself and was corroborated by obstetrical research pertaining to the true toxemias of pregnancy and fetal injury due to maternal antitoxins.

From the field of bacteriology let us turn to a field less widely explored and less widely understood, namely the role played by cell substances in snake venom as a cause of disease, and the working of the toxin antitoxin mechanism as shown by experiments. This consideration is very pertinent to our subject, because it furnishes proof by analogy that the cell substances from the fetus, if toxic, cause disease in the mother, just as cell substances of the venomous snake cause disease, and that the retaliative maternal antitoxins, specific to the toxic cell substances from the fetus, are responsible for fetal injury and death manifested in erythroblastosis fetalis, etc., just as specific antitoxins to snake venom will injure and kill the snake. The proof of these propositions involves the behavior of blood components, and here it again seems likely that the agglutination of red cells containing the toxic substance, or substances involved, is but the first, most sensitive, and the most striking manifestation that the red cells are beginning to be injured by the lysins of the antitoxin, and that hemolysis represents a later and more serious manifestation of injury, and that what in blood parlance have been designated as hemotropins, are the same entities that in bacteriology have been designated as opsonins. It is likely that such disssimilarity in nomenclature would not have arisen had it been sensed that the red cells in human blood could contain substances relatively toxic to the cells of other individuals of the same species and for this reason respond to specific antitoxin attack as do the red cells of venomous snakes and bacteria under antitoxin attack.

The snake may be considered as an aggregation of cells containing in their molecular structure the cell substances of the parent cell—the fertilized ovum. The basic cell substances give evidence of being present in the fixed and red cells of the snake. Infinitesimal particles of these cell substances are given off to the surrounding fluid medium, the serum. These substances are concentrated in the saliva of the snake and form the toxic substances of the venom. This venom may cause disease and death to susceptible forms of life at the same and different levels of the phylogenetic tree. Cure of the disease manifestations is influenced either by the active generation by the host of specific antitoxin or the prompt administration of processed antitoxin. Now, if this specific antitoxin is mixed with the snake's blood, we witness exactly the same phenomena that obtain when incompatible blood is attacked by the serum of the recipient, namely, agglutination and hemolysis. If the antitoxin is injected directly into the snake, the snake shows clinical signs of basic pathology and dies under sufficient dosage and, under the microscope, there are indications that all the cells, fixed and otherwise, that contain the toxic cell substances, are injured by the antitoxin. We see the same type of phenomena that we see in fetal injury and death due to maternal antitoxins, in conditions such as erythroblastosis fetalis, congenital hemolytic anemia, neonatal jaundice, etc. The mechanisms are analogous. Furthermore, experiments suggest that certain snakes that have been present in an environment of rattlesnakes for millions of years, have come to develop a complement of inherited specific antitoxin to rattlesnake venom, as the O type mother has come to inherit a complement of anti-A and anti-B antitoxin, due, conjecturally, to cell substance attack during the ages of fetal mother relationship. The king snake, for example, is relatively immune to rattlesnake venom. When rattlesnake red cells are tested against king snake serum, the latter agglutinates and hemolyses the rattlesnake red cells, suggesting that the king snake's serum contains a complement of antitoxin against the toxic cell substances of the rattle snake, just as the O type mother contains a complement of anti-A and anti-B antitoxin that imparts to her a relative immunity to the A and B intraspecies cell substances. This immunity is only relative, as one can prove by following the antitoxin titer and the signs of clinical disease in the mother in cases of the true toxemia of pregnancy. Here, as in all toxin antitoxin setups, the severity of the manifestations of disease vary directly with the virulence and dosage of the toxic substance or substances, and inversely with the strength of the antitoxin. In the case of the toxemic mother, after delivery, which removes the source of the toxin attack, as well as the antitoxin absorptive potential of the cells and the fluids of the products of conception, the antitoxin tends to accumulate in the mother, and the faster and higher it rises in strength the more rapidly the signs and symptoms of toxemia tend to disappear.

Research in the toxemias of pregnancy from the standpoint of a fetal cell substance cause, has apparently solved several major obstetrical problems that have always been puzzling in the past: why, for example, may a woman, under the same meticulous care, suffer from an almost fatal toxemia in her first or any pregnancy, and in later pregnancies show no signs of toxemia? The answer would seem to be that if she establishes a high grade of immunity against a toxic cell substance in her first or any pregnancy, this immunity tends to protect her in subsequent pregnancies with the same cell-substance-type of child. These verifiable findings furnish a logical reason for the statistical finding that toxemia is much less frequent in multiparae than in primiparae. In any pregnancy, a true toxemia will not develop if the child chances to inherit cell substances identical with those of the mother, or cell substances not toxic to her cells.

Again, obstetrical research has answered the long puzzling question of why the same woman may almost completely absorb one dead fetus with few or no signs of disturbance, and then with another, show alarming signs of disease almost at the beginning of absorption. The difference depends upon whether the cell substances of the child are similar to her own and nontoxic, or the cell substances of the child are toxic to her cells.

Within the past few months, Dr. G. A. Matson, director of the Minneapolis War Memorial Blood Bank, who has done outstanding work in testing out the blood group status of Indians and Eskimos, and shown that the Blackfeet Indians, for example, are an 80 per cent pure A group stock, consented to try to throw light on the hypothesis of the cell substance cause of toxemia by an ethnological approach. The argument suggests itself that if the hypothesis be true, then one should be able to predict that toxemia would seldom be seen among such people. From answers to his inquiries he found this to be the case. The results of these inquiries, considered as a form of proof by prediction, would tend to support the hypothesis.

Since this hypothesis was presented to this society, three and one-half years ago, every effort has been made to test the hypothesis by every form of clinical, serologic and experimental attack. So far, all findings have converged upon it in proof and thus attested its probability.

Whatever advantages the implications of this hypothesis may offer in point of improved treatment, little will be accomplished until men are convinced of the soundness of the hypothesis and are willing to be guided thereby in their approach to treatment.

Granting a serologic cause for such adequately proven cases of true toxemia, an important part of treatment should be serologic in character. Transfusions or injections of group compatible blood or serums of proper Rh status would seem to be the answer. In the past we have unwittingly used this form of treatment in cases of severe anemia and blood loss in cases of toxemia, but, when the outcome was successful, all benefit was accredited to the replacement therapy, without a thought of the possible benefit of the antitoxic properties of the transfused blood.

Transfusions should aid: by raising the hemoglobin content and by increasing the oxygenating capacity of the blood and thus increasing its detoxifying power; by adding chemically normal blood and replacing albumen lost in the urine; by relieving the maternal tissues of a fraction of the brunt of toxin attack by the absorptive potential of the transfused blood; and, where the A or B substances are involved as toxins, furnishing an inherited complement of desired antitoxic substance. When the opportunity offers, and conditions warrant, the best type of blood or serum to use should be that of a woman who has just recovered from the same cell substance type of toxemia, and whose antitoxin titer is still demonstrably high. Before the child is separated from the mother, a marked increase in the maternal content of antitoxin would logically be prejudicial to the child.

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1870

EXERCISE FOR WOMEN

" . . . In the true sense, calisthenics as used in the schools, *is not exercise at all.* To perform the motions, labor of body is required, and the mental and physical strain is at least that of an ordinary recitation. Just so an invalid, ordered to walk or ride *as a remedy,* is very like to take it as such, and thus lose almost all the good it was intended to accomplish. Exercise, for its own sake, for the pleasure it affords, in complete relaxation from mental effort, and from conscious systematic physical exertion, is the only *real* exercise.

Hence, the all-important practical lesson (to apply which in individual cases calls for a good deal of tack and management), that ordered for an invalid, the ostensible motive should be the *pleasure* it affords.

Horseback exercise, to learn to ride easily and gracefully, and for the real gratification which the ability to control a spirited animal affords. Carriage rides, and walks to gather flowers, to visit beautiful localities, or get beautiful views, and for the exhilaration which such exercise, properly, and in the fresh air, and with pleasant company, always occasions. Boating, to learn the use of the oar, etc.

The *last motive* to urge, should be the remedial effect; that should be kept in the background, and as far as possible out of sight of the patient."

Charles N. Hewitt, M.D.: Muscular exercise as a remedy in diseases of women. *Northwestern Medical and Surgical Journal* 1: 98, 1870.

Intra-Partum Care

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Obstetrical labor is *work!* Whether the obstetrician practices the "Garden of Eden" method, one or many of the many modifications of obstetric analgesia, amnesia or anesthesia, or even if he has been caught in the enthusiasm for "natural labor," he will agree that childbirth is work.

Effective education, lay and professional, has done much, through pre-partum care, to reduce maternal mortality. This, and not bureaucratic meddling, has been the chief factor in bringing women to labor in better condition than was the case a decade or two ago. The largely preventable convulsive toxemias of pregnancy emphasize this point, and illustrate the importance of the personal relationship between patient and physician.

While pre-partum care has been stressed by the physician, other factors have appeared which, if not carefully controlled, may do much to nullify the good obtained by pre-partum care. The small general hospital is doing an admirable job in caring for maternity patients. The preponderance of births in hospitals, even in the most rural states, is amazing and, we feel, gratifying. But with the concentration and sometimes crowding of maternity patients into such hospitals, with a lack of interns and residents, and with the increased responsibility which has been assigned to nurses, the intra-partum period may well develop certain preventable hazards.

The mean duration of labor has been reported as slightly over 13 hours in the white, primiparous patient and over eight hours in the white multiparous patient.[1] For the normal individual, the sensible and insensible fluid loss approximates 3500 cc. per day. It is not difficult to understand that the fluid lost in labor would often far exceed the normal figure. Atmospheric conditions, the environment of labor, emotional and physical factors associated with labor, the season of the year may may all serve to aggravate the normal fluid loss. Add to those, hyperventilation and vomiting, which are not infrequent in labor, and we see that there is not only depletion of fluids but that the electrolyte balance may be grossly disturbed as well.

Oral restoration of fluids during labor is often unsatisfactory and sometimes dangerous, due to restlessness, amnesia or analgesia, an impending anesthetic, or vomiting. We feel that the administration of parenteral fluids in amounts of from 500 cc. to 1000 cc. should be given intravenously in labor at the slightest suggestion of dehydration. Five per cent dextrose in sterile normal saline solution is most commonly used, except where there is evidence of salt retention, in which case sterile distilled water is used instead of the normal saline solution.

While the time of labor, obviously, does not permit the correction of malnutrition, it is a time when nutrition should be maintained. The caloric value of ingested food in a twenty-four hour period should balance the energy lost by the individual during this period. In protracted labors this may prove to be an important problem and one not easily solved. In any labor, anorexia is the rule. Vomiting, delayed absorption due to retarded gastric emptying and the action of various medications, may all contribute to caloric deprivation. While we attempt to supply the necessary "fuel" to balance the increased energy requirements of the woman in labor, we would urge caution in how this is done! The aspiration of food is a very real danger in labor, especially during anesthesia. Early in labor, and especially in primiparous patients, the giving of frequent, small servings of sugared fruit juices, sugared tea and clear broth aid materially in providing needed nourishment and in maintaining morale, with little increased hazard; but where energy and fluid intake are both low, we believe it far safer to supply these by intravenous injections of dextrose solutions as indicated above.

There is no obstetrician of experience who has not, at some time or other, discovered a distended bladder in labor! Such distention is usually quite evident, objectively. What does not appear to be quite as evident is that pregnancy produces a degree of atony of the ureters and bladder which predisposes to dilatation, stagnation and attendant infection[2]; and that one of the chief causes of morbidity in the puerperium is urinary tract infection. Our experience teaches that frequent and complete emptying of the bladder during labor is of great prophylactic value in preventing urinary tract infection in the puerperium. Spontaneous and complete voiding during labor is often absent or delayed, leading to bladder distention and trauma. While the distention would have to be excessive to interfere with the descent of the presenting part in labor, cystoscopic examination of the bladder, post-partum, sometimes reveals hemorrhagic cystitis, edema and evidence of bacteremia, especially where incomplete emptying of the bladder during labor has been allowed to continue.[3] This certainly provides a fertile field for urinary tract infection. Post-partum bladder atony is less marked if the bladder is not allowed to become over-distended during labor. Just as in gynecologic surgery, where we feel that catheterization, done gently and with absolute asepsis, is excellent prophylaxis against urinary tract infections, so it is in labor.

The perfect analgesic and anesthetic agent has not yet been discovered. Witness the long list of drugs that have been and are being used in obstetrics to make labor bearable! Without entering into a discussion of the merits or de-merits of any drug or combination of drugs used for pain relief in labor, it should be pointed out that all may have effects other than those for which they were prescribed; nor can one ignore the cumulative effects which sometimes appear. The vomiting produced in many patients following the use of morphine is well known. Morphine and Demerol seem to have an antidiuretic action in some individuals.[4] In the gastro-intestinal tract, depressed gastro-intestinal motility and increase of the already prolonged gastric emptying time are common. Respiratory depression, mydriasis and paralysis of sweat and salivary glands are other undesirable side effects which are sometimes noted, following the use of certain analgesic and amnesic drugs in labor. Some of these undesirable side effects can be greatly minimized in labor by the giving of oxygen through a well-fitted mask. We would emphasize two points: (1) Oxygen, so given, frequently exerts a sedative effect upon the mother and (2) irregular heart tones often become regular and maintain their regularity, following a few inhalations.

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In our undergraduate teaching to student nurses, we emphasize the safety and practicability of following the course of labor by abdominal examinations, the location and character of the fetal heart tones and the character of the uterine contractions. The ease and frequency with which rectal examinations are done is not an unmixed blessing and the examinations are by no means harmless. Because rectal examinations have become so common and because they are sometimes performed by several individuals, with varying degrees of skill and gentleness, they can be a source of danger. In our general hospitals with well-equipped maternity departments, the vaginal examination of the obstetric patient has been reduced to a minimum and it is well recognized that it must be done under strictest surgical asepsis in the labor or delivery room. While the rectal examination does not require the surgical ritual of the vaginal examination, it seems to us that it has been abused, and not without some danger to the woman in labor. If done too frequently, there is unnecessary pain caused; if done carelessly and roughly, the danger of genito-tract contamination is a real danger. Rectal examinations should be reduced to a minimum and should always be done gently, under direct vision, and with no groping for the anal orifice. To reduce the possibility of genital tract contamination still further, the use of the tight T-binder with tight perineal pad should be abolished, wherever it may still be in use.

The care of the bowels during labor can be greatly simplified if attention is directed solely to the condition of the pelvic colon and rectum. The "high" enema, in a woman in labor is, in our opinion, a misnomer. We want the pelvic colon and the rectum empty in labor, if possible, and, to accomplish this, recommend a warm tap-water enema early in labor. If the woman is admitted in advanced labor, the enema should be omitted. It is far easier to prevent genital tract and newborn contamination from hard, formed stool than from a flood of liquid feces!

The temperature, pulse and blood pressure of the woman in labor should be taken and recorded every four hours in the uncomplicated case and individualized in the complicated one. The frequency and duration of the uterine contractions and the rate, location and character of the fetal heart tones are to be noted and recorded every 30 minutes during the first stage of labor. More important than the ritualistic following of the above procedures, however valuable they may be, is the training of the attendants to recognize and report any departures from the normal. These may be many and varied but we stress a rising pulse rate, any marked variation in blood pressure, slowing or irregularity of the fetal heart tones and the passage of meconium. We insist that the patient be under constant surveillance from the very onset of labor. During the second stage of labor, or if evidence of fetal embarrassment has been noted earlier, the fetal heart tones are to be checked at intervals of from three to five minutes.

Tranquillity is to be maintained in the first stage or labor room and quiet efficiency in the birth-room. Both of these are large orders to fill, especially when an obstetric supervisor is working with eager but inexperienced student nurses and an insufficient number of graduate assistants. But if the physician will lend his aid and his patience to the kindly encouragement of the supervisor and her assistants, we know that the nursing care his patient receives in labor will be greatly improved.

Segregation of labor and delivery rooms from the remainder of the hospital and, for that matter, from the post-partum floor is of the utmost importance. Masking of all birth-room attendants is mandatory. The exclusion of all attendants with sore throats or upper respiratory infections from attendance upon the woman in labor is, of course, also mandatory. Not so easily controlled are visitors, even in the best regulated hospitals. Air-borne pathogens as possible sources of sepsis must always be kept in mind. It has been pointed out, for example, that the air concentration of hemolytic streptococci and other organisms rises sharply following such a procedure as changing the perineal pad in a post-partum patient.[5]

The busy physician and the harassed maternity floor attendants sometimes fail to consider the emotional side of the patient in labor. One does not need to subscribe to the revival of the so-called "natural method" of labor by Read and others to agree that much of the stress and strain of labor may be ameliorated by a quietly cheerful and confident manner upon the part of the physician, reflected in a sympathetic, helpful and encouraging attitude upon the part of the nurse. Thus mental environment in labor as in so many other worthwhile human activities, may be improved. As to physical environment, a light, bright room with some decorative touch can still meet the requirements for cleanliness and be simple and effective.

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Dystocia Due to Solitary Pelvic Ectopic Kidney

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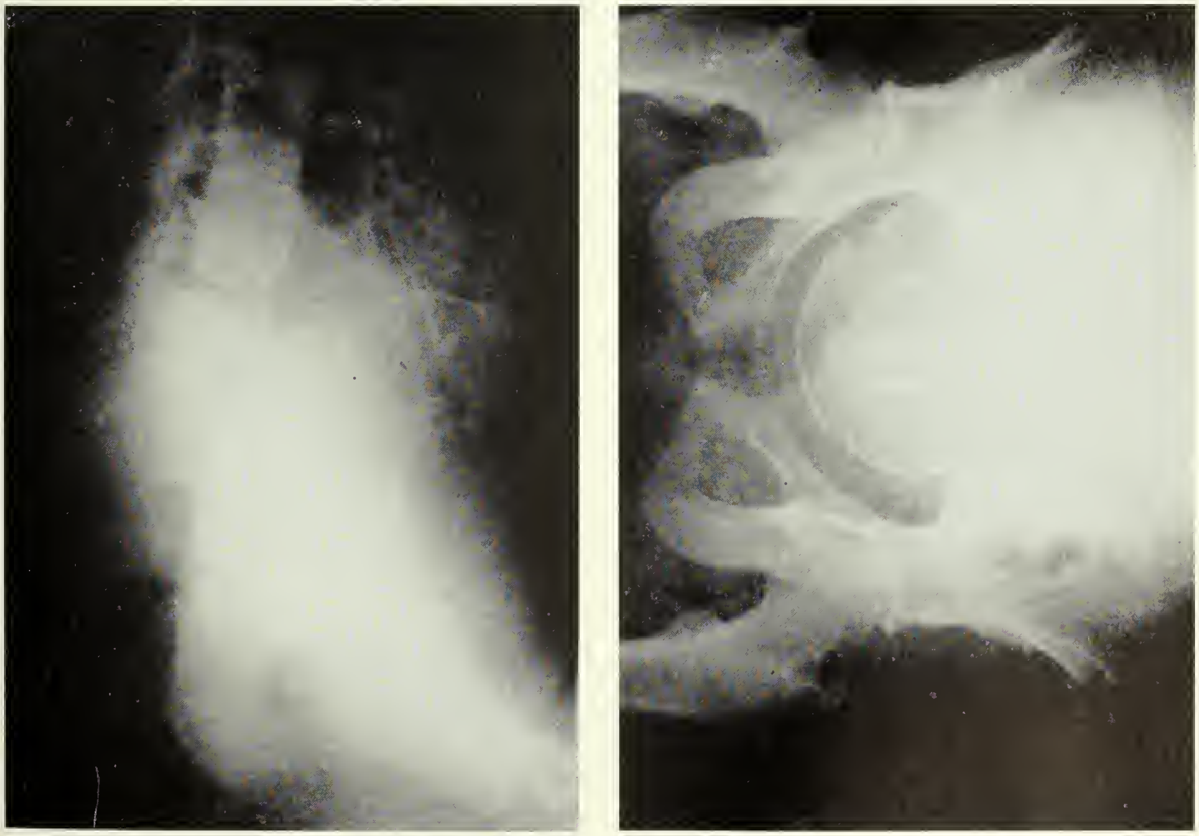
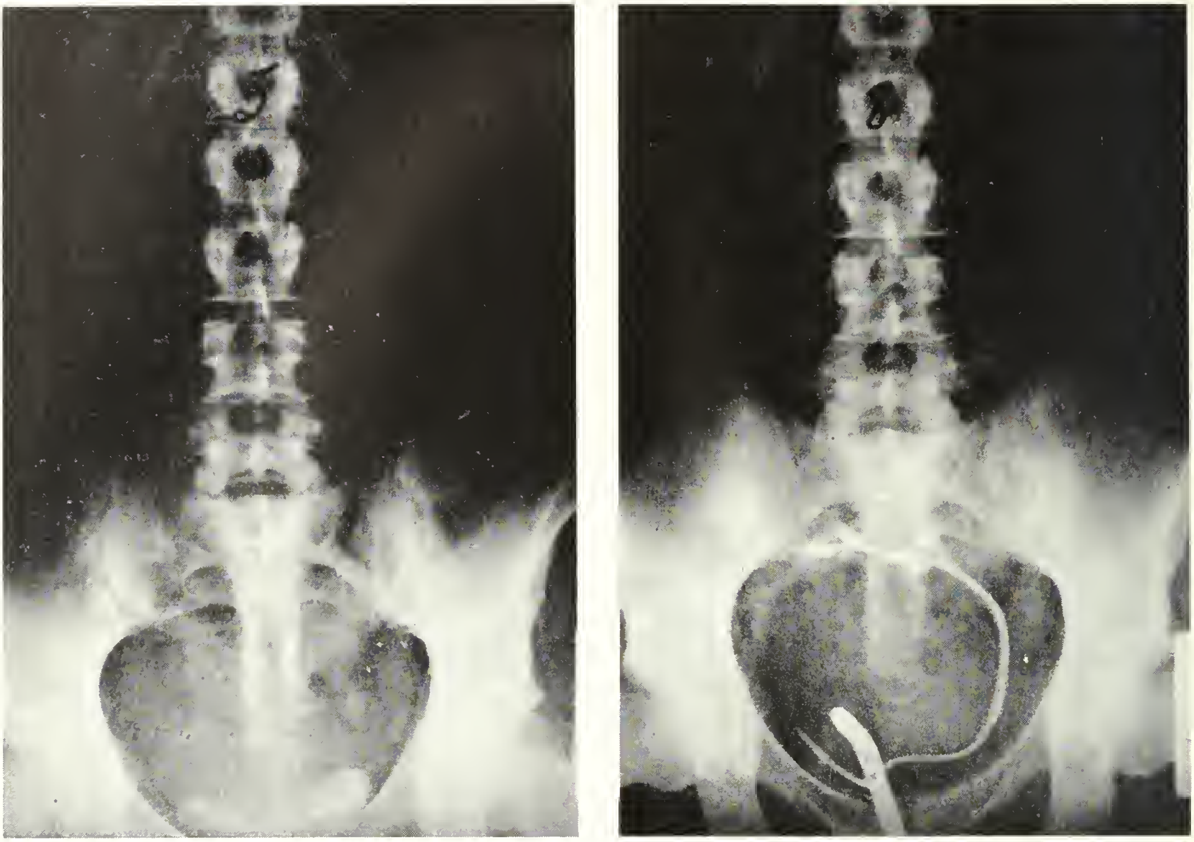
Congenital anomalies of the urinary tract are common, and pelvic ectopic kidney is one of the commonest. There is a voluminous literature on misplaced kidneys. In gynecological textbooks they are mentioned in the differential diagnosis of pelvic tumors in women. In most of the obstetrical textbooks of the past 100 years ectopic pelvic kidney is mentioned as a possible cause of dystocia. However, it was not until Craigin[1] in 1898 described six cases obstructing labor, that case reports appeared in the literature. Since then there have been undoubtedly many cases of such obstructed labor but a search of the literature reveals very few case reports. Bland-Sutton reported one case early in the century; Pease,[2] Schelleken,[3] Riley,[4] and Siegel[5] have reported cases in the past twenty-five years, of dystocia due to pelvic ectopic kidney. In their masterly presentation of extra-genital pelvic tumors Lovelady and Dockerty report 56 pelvic kidneys, only one of which complicated pregnancy. In the discussion which followed the presentation of this paper another case of dystocia due to pelvic kidney was reported by Herring. He also reported the removal of a retroperitoneal mass which "proved to be a kidney and the only one the patient had." They noted that several of the women having pelvic kidneys had delivered normally. In the two cases reported by Pease, both women had delivered vaginally previously.

It is noteworthy that practically all of these tumors when found to be obstructing labor were considered to be ovarian tumors. The treatment advised in previously reported cases has been cesarean section, with removal of the tumor.

Since this case was handled in a slightly different manner, and because reports of such cases in the literature have been infrequent it would seem profitable to draw the attention of this group to this congenital anomaly and its grave possibilities.



Figs. 1 and 2. X-ray report. "Films of the pelvis . . . show a single pregnancy at term with vertex presenting. The pelvis should be adequate for normal delivery."



Figs. 3 and 4. X-ray report: "The findings are consistent with an ectopic left kidney, which lies at the level of the sacrum, and probable atresia of the right kidney."

CASE REPORT

Case No. 164600, R. M. D. Asbury Hospital age 20, gravida 1, para 0, admitted in early labor at term April 14, 1949. Consultation was requested because of floating head at term. Rectal examination revealed a thick undilated cervix, floating head which could be impressed to the spines. X-rays were ordered and reported as follows (Figures 1 and 2): "Films of the pelvis . . . show a single pregnancy at term with vertex presenting. The pelvis should be adequate for normal delivery."

Labor continued to be slow and painful, with frequent rests, for 75 hours, at which time a vaginal examination was made by the patient's physician. The cervix was found to be 7-8 cm. dilated with presenting part at spines. Her physician was advised to repeat the rest period and await further progress. When I saw the patient again, at 86 hours, an acutely tender cystic mass was felt behind the presenting head, dilatation of cervix 6-7 cm., presenting part at the spines. Membranes had been ruptured for 24 hours.

An evaluation of the patient at this time revealed: (a) fetus active, F.H.T. regular at 140, in occiput left posterior position, head not engaged; and (b) mother in good condition in spite of more than three days mild active labor, temperature 98.4°, P. 96, B.P. 144/108. The patient had no albuminuria, but the membranes had been ruptured for 24 hours, and she had had numerous rectal and one vaginal examination.

The patient was given saddle block anesthesia (22.5 mg. Metycaine in Ringer's Solution) and examined again. The cervix was found effaced, dilated to 6 cm. The mass, thought to be an ovarian cyst, was readily pushed over the pelvic brim into the left iliac fossa and the patient then allowed to have four or five strong contractions. Examination then revealed that the mass was again obstructing descent.

Duhrrssen's incisions were made, Kielland forceps applied, the "cyst" pushed again into the iliac fossa and a normal living male weighing 3388 grams delivered easily. The incisions were repaired, and the patient was given prophylactic penicillin. The temperature post-partum did not rise above 99.6° and the patient was discharged in good condition, with the baby, on the fifth day postpartum. She was told of the presence of the tumor and advised to have it removed.

The patient was hospitalized for "removal of left ovarian cyst" on June 9, 1949. However, on pelvic examination at this time it was felt that the tumor was "definitely retroperitoneal, firm, and flat and rounded, with the consistency of kidney."

X-rays made at this time were reported as follows: "Intravenous urograms and retrograde urograms on June

8, 9 and 10, 1949, show no evidence of kidney outline on either side. The psoas shadows are clear. There is no evidence of urinary stone. There is a short ureter on the left side with an ectopic kidney overlying the sacrum. The right ureter is very short and there is no evidence of any filling on the right side. There is apparently atresia on the right."

The conclusions were: "The findings are consistent with an ectopic left kidney which lies at the level of the sacrum, and probable atresia of the right kidney."

The patient was informed of the nature of the tumor, and advised that future pregnancies should be delivered by cesarean section and warned against the removal of her tumor.

Comment

A case report has been presented of an unsuspected solitary ectopic pelvic kidney obstructing labor in a primipara at term, with vaginal delivery, and subsequent demonstration of the nature of the tumor by intravenous and retrograde pyelograms. The nature of any tumor obstructing labor should be determined before removing the tumor, as the tumor may be the patient's only kidney.

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IT'S GETTING SAFER TO BE A BABY

The 1948 infant mortality rate for the United States was the lowest on record, with the number of deaths in those under one year of age reported as 113,169. The number of births in this year was 3,535,068, thus giving a rate of 32.0 deaths per 1,000 live births. The rate was 32.2 in 1947, and 47.0 in 1940. Provisional figures indicate a further decline in 1949 to an estimated rate of 31 deaths under one year of age per 1,000 live births.

By states, the infant mortality rates recorded in 1948 ranged from 24.3 for Connecticut, and 25.5 for Oregon to 46.2 for Texas, 56.4 in Arizona, and 70.1 in New Mexico. As a whole, the 1948 rates for each state showed only small differences from the 1947 rates, but the rate for every state was lower in 1948 than in 1940. In 1948, the infant mortality rates for 32 states and the District of Columbia were below 35.0 deaths per 1,000 live births; while, in 1940, the rates for only three states, Connecticut, Minnesota and Oregon fell below this figure.

The mortality risk is greater in the first day of life than at any other period during infancy. One-third of the deaths in the first year of life occur in the first day, a second third (36.0 per cent) in the remainder of the first month of life, and the last third (30.7 per cent) at ages of more than one month but less than one year. In every one of these age intervals the infant mortality rates for males are higher than those for females, and the rates for non-white infants higher than those for white infants.

The infant mortality rate has been reduced by 50 per cent since 1930, when it was 64.6 deaths per 1,000 live births. The greatest gain has been made in the rate for infants 6 to 11 months of age. In this group, the rate has declined 72 per cent, from 10.7 in 1930, to 3.0 in 1948.

With the greater declines in the death rates for the contagious and infectious diseases, the causes associated with conditions before and at birth have become more prominent. In 1948 premature birth was the leading cause of infant death, with a rate of 11.1 deaths per 1,000 live births. Congenital malformations, pneumonia and influenza and injury at birth followed in importance; diarrhea and enteritis was the fifth cause in rank. In 1930, pnemonia and influenza was second in importance to premature birth, with diarrhea and enteritis third; and congenital malformations and injury at birth, fourth and fifth.

Nonspecific Urethritis in Women*

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THE majority of male patients with urinary symptoms receive local therapy in the form of prostatic massage, urethral dilatation and urethral instillation for existent, and more often nonexistent, urethritis. The woman with urinary symptoms, however, has been a victim of chemotherapy and antibiotic barrage which frequently fail to relieve her symptoms. One of the commonest maladies in woman who are more than forty years of age is chronic granular and cicatricial urethritis. The disease process may be present as either a granular or a cicatricial urethritis, or the two conditions may coexist.

The female urethra is situated in a region that is vulnerable to infection. Discharges from the vagina and cervix collect in the vestibule and gain easy access to the urethral meatus. Winsbury-White has demonstrated in guinea pigs the spread of infection by way of the lymph vessels from the cervix and vagina to the vesical trigone. Sanitary pads lying in close apposition to the urethral meatus harbor bacteria that are easily introduced into the urethra. The female urethra is the recipient of recurrent physiologic trauma during parturition and coitus, yet it has a minimal protective covering. Parturition, even when expertly managed, produces a certain amount of trauma to the urethra as it is compressed against the symphysis pubis. In cases in which abnormal delivery is accompanied by extensive perineal tears, the urethra or periurethral tissues may be injured. Urethral instrumentation is also a common cause of injury of the female urethra. Poor technic and carelessness in carrying out urethral catheterization and the injudicious use of obstetric forceps are among the common causes of trauma to the female urethra. The prolonged use of inlying urethral catheters in cases in which patients are unable to micturate during the early postoperative period is almost always certain to introduce infection into the urethra and bladder. The role played by focal infection as an etiologic factor in chronic urethritis is questionable; however, in cases in which the patients fail to respond to the usual therapeutic measures, a search for foci of infection and their elimination occasionally have been effective in relieving the urinary symptoms.

The commonest symptom encountered by women who have either granular or cicatricial urethritis, or both, is frequent and painful micturition. The interval of time between each voiding may vary from thirty minutes to two hours during the day, yet the patient may not be awakened by the urge to void during the night. The pain that accompanies micturition usually is burning in character and is most severe toward the end, or even after the act has been completed. The pain may be localized to the urethra or may be referred to the vagina or even the perineum. Urinary urgency and hematuria are encountered occasionally in cases of granular or cicatricial urethritis. The urethra and the urethral meatus may be narrowed as a result of extensive cicatricial changes in the submucosa and the periurethral tissues. Symptoms of urinary obstruction characterized by hesitancy in micturition, an intermittent stream of urine, and incomplete emptying of the bladder may be encountered in cases of marked cicatricial urethritis. The microscopic examination of the urine usually does not disclose any abnormality although it occasionally may reveal pyuria and bacteriuria.

Cystoscopic and urethroscopic examination is necessary in order to establish a diagnosis of granular or cicatricial urethritis. The urethroscopic findings in cases of cicatricial urethritis are a narrowing of the urethral meatus and a contracture of the urethral lumen in either its entire course or in localized areas. Dilatation of the urethral meatus may be necessary before a 24 F. cystoscope can be introduced. The narrowed urethra grips the instrument tightly as it is passed through the channel. The urethroscopic findings in cases of granular urethritis are characterized by a reddened, edematous and granular appearanec of the urethral mucosa. These changes are most marked in the region of the vesical neck, although the entire urethra may be involved. The mucosa bleeds easily as the instrument is passed over the granular areas. Epithelial tags in the region of the vesical neck appear like stalactites on the roof of a cavern when the area is viewed with a lens instrument. These tags are patches of epithelial hyperplasia resulting from chronic inflammation.

The dilative effect on the urethra of the urethroscopic examination frequently temporarily alleviates the symptoms of chronic granular and cicatricial urethritis. The astringent and mild antiseptic effect of organic preparations of silver such as argyrol (mild silver protein) and protargol (strong silver protein) are soothing to the granular urethra. A five per cent solution of argyrol can be applied to the urethral mucosa by instillation or on tampons. A one per cent protargol suppository placed into the urethra for a period of twenty minutes has proved to be effective in relieving urinary symptoms associated with granular urethritis. Either type of treatment should be repeated biweekly for three to four weeks.

Urethral dilatation is the most direct approach toward the alleviation of symptoms caused by chronic cicatricial urethritis. Caution must be exercised to avoid superimposing additional trauma on an already damaged urethra, that is, the temptation to carry out too great a dilatation at the first sitting should be inhibited. Straight rather than curved urethral sounds should be employed in the female urethra. The usual cleansing of the vaginal vestibule should precede urethral instrumentation, and the application of a local anesthesia to the urethral meatus will add to the patient's comfort. The largest caliber sound that can be passed easily through the urethra should be used for the initial dilatation. It is a good rule never to increase more than two sizes of the French scale at a treatment, and the treatments should be spaced at intervals of four to five days. The dilatations should be carried out until a 36 F. sound can be passed through the urethra easily. In some instances, a congenitally narrowed urethra will resist the passage of a 36 F. sound, and in such cases it is best to carry the dilatation to a point where the sound stretches the entire urethra.

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*Read at the meeting of the Minnesota Obstetrical and Gynecological Society, Rochester, Minnesota, April 27, 1950.

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Perhaps the pitfall most commonly encountered in the treatment of chronic granular and cicatricial urethritis is energetic overtreatment. The prolonged use of the sulfonamide drugs and antibiotics usually is ineffective in the treatment of this condition. Transurethral fulguration of the granular areas and mucosal tags has been advocated, but we have not obtained satisfactory results with this procedure. Coexisting associated pathologic conditions must be corrected to enhance the effectiveness of the treatment of chronic granular and cicatricial urethritis. Cervicitis, vaginitis, prolapse of the urethral mucosa, urethral caruncle and urethral diverticulum are among the conditions that may be associated with this disorder. Urinary frequency without dysuria is commonly mistaken as a symptom of disease of the lower part of the urinary tract. Careful questioning of the patient usually reveals the fact that this isolated symptom is related to periods of emotional stress or to an excessive intake of fluids. Senile atrophic vaginitis may exaggerate the symptoms of an existing chronic granular cicatricial urethritis. Estrogens are a valuable adjunct in the treatment when the two conditions coexist.

Summary

Recurrent urethral infection and trauma are the commonest causes of chronic granular and cicatricial urethritis. Urinary frequency and dysuria are the usual symptoms associated with this disease. The predominant urethroscopic findings are patches of reddened, granular urethral mucosa and narrowing of the urethral lumen. Local therapeutic measures applied to the urethra are the most effective means of relieving urinary symptoms attributed to chronic granular and cicatricial urethritis.

THE UNUSUAL CASE OF MARY TAFT

On 23 April 1726, Mary Taft, the wife of Joshua Taft, a Surrey journeyman clothier, and the mother of three children, declared she had been frightened by a rabbit while at work in the fields, and this so reacted upon her system that in November of 1726 she was delivered of a pig and fifteen rabbits. During this confinement she was attended by the local apothecary, John Howard, who maintained that he had actually felt the rabbits leaping in the womb. He communicated with Nathaniel St. André of Westminster Hospital and Samuel Molyneux, Secretary to the Prince of Wales. Dr. St. André investigated briefly and bore out Mr. Howard's statement, whereupon the Court became greatly interested. George I ordered his personal surgeon, Cyriacus Ahlers, to investigate; but the latter made only an equivocal report, and the King then asked Sir Richard Manningham, one of the chief obstetricians of the time, to look into the matter. Manningham was able to uncover the imposture, and Mary Taft was imprisoned and confessed.

Many pamphlets and squibs appeared on the subject, and Hogarth even used the subject in one of his caricatures. For a time there was a craze to sell sets of these pamphlets bound in rabbit skin. While the Army Medical Library does not have any of the rabbit-bound works, it does contain most of the contemporary tracts, including two copies of Dean Swift's satire, *The Anatomist Dissected,* by Lemuel Gulliver, London, 1727.

from Army Medical Library News, p. 47, April, 1950

Diagnostic Problems Following Abortion: Two Case Reports

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ABORTION CASES as seen by the physician frequently present problems that make diagnosis extremely difficult, even when the presence of a pregnancy is known. In the following two patients who were seen concurrently some features of similarity are present, yet the possible pitfalls in treatment are obvious.. One must always keep in mind the fact, as evidenced in one of these cases, that even though a patient gives a history of a criminally induced abortion with infection and has all of the objective findings to corroborate such a condition, tubal pregnancy may be the basis of the pathology. The second case points out the dangers of excessive fluid administration to any patient.

CASE 1

T. K., a white female, aged 28, divorced, gravida II para I, was first seen on April 18, 1949. Past history was essentially negative with the exception of treated lues in 1945. Wassermann at present negative. Her previous pregnancy was normal with a normal delivery in 1943 of a six-pound male infant.

Her menses had started at age 11, were always regular every 28 days, with a five-day flow with passage of no clots and no pain. Her last menstrual period was February 22, 1949.

The patient stated that on April 1, 1949, she had been to an abortionist who "opened the womb and packed it with gauze," and that this procedure was repeated each day for a period of seventeen days. It had been omitted for the first time on the day of my examination since the patient told the abortionist that she was having slight difficulty in breathing and had "pleurisy pains." The patient also said that she had been having a heavy flow with cramps for the five days preceding the present examination but with no apparent fever or chills.

The general physical examination was negative. Her temperature was 98.6°, blood pressure 120/70, pulse 76, hemoglobin 72 per cent, white blood count 11,000.

Pelvic examination revealed a small amount of vaginal bleeding, cervical os was closed, the uterus was normal in size and anterior, and the adnexae were essentially negative with only slight tenderness bilaterally. The patient was advised to enter the hospital for observation and treatment but refused to do so. The tentative diagnosis at this time was potentially infected complete abortion at about four to six weeks.

The patient returned the following day complaining of more abdominal pain and some shoulder strap pain. Re-examination at this time showed continued vaginal bleeding and in addition a small right adnexal mass with induration and moderate tenderness. There was some diffuse lower abdominal discomfort on deep palpation, no rebound tenderness, no rigidity, no mass palpable. At this time because of the increased discomfort the patient agreed to enter the hospital.

On April 19, 1949, the patient was admitted to the hospital complaining of abdominal pain, slight pain in the right shoulder, foul vaginal discharge, and a diarrhea of two days' duration. The examination on admission revealed a thin, sallow young woman not acutely ill, with blood pressure of 98/54, hemoglobin 65 per cent, white blood count 11,000. There was now present rebound tenderness in the abdomen and a suggestion of dullness in both flanks. The pelvis remained the same as before. The diagnosis on admission suggested (1) pelvic inflammatory disease resulting from criminal (complete?) abortion; (2) possible uterine perforation with intra-abdominal bleeding; (3) possible ruptured tubal pregnancy.

A Friedman test was ordered and reported positive on April 21, 1949, but this was considered non-diagnostic, however, in view of the short time that had elapsed since the attempted abortion.

About 12 hours following admission the patient became acutely ill with a temperature of 104°, blood pressure 60/50, pulse 80, respiration 14, and incoherent speech. On examination of the pelvis a slight enlargement of the uterus was found as well as fullness in the cul-de-sac extending to both adnexae. Hematology showed a hemoglobin of 58 per cent, white blood count 11,000 (78 per cent PMNs, 21 per cent lymphocytes, one per cent monocytes). Treatment at this time consisted of the administration of three units of blood five hours apart, one liter of saline, penicillin 100,000 units Q.3.H. and streptomycin ¼ gram Q.4.H.

The patient improved steadily following this treatment and examination on April 22, 1949, revealed an extremely tender mass in the right cul-de-sac. Despite this finding conservative treatment was continued, and a vaginal examination on April 29, 1949 showed that this pelvic mass had persisted and was now firm in consistency, behind and to the right of the cervix, moderately tender, non-fluctuant, and bulging slightly to the right lateral fornix and posterially to the rectosigmoid. The cervix appeared normal except for a bloody mucous discharge from the external os. The primary diagnosis at this time was again that of an acute pelvic inflammatory disease. A second Friedman test was ordered on May 3, 1949.

On May 4, 1949, the patient started to vomit and complained of severe abdominal pain. Hemoglobin was 76 per cent and white blood count, 11,000. Blood and saline solution were given. Vomiting and pain continued through until May 5, 1949, when the second Friedman test was reported positive. At this time an exploratory laparotomy was performed through a lower mid-line incision in the abdomen. Large amounts of old blood with many large clots were found in the peritoneal cavity. The left tube and ovary appeared normal. The uterus was enlarged, in an anterior position, but with no evidence of perforation. The right adnexa, however, revealed a tubal pregnancy which was confirmed microscopically. Apparently the tube had ruptured at its inferior border into the right broad ligament which in turn had ruptured into the peritoneal cavity. The right tube was removed, controlling the bleeding, the abdomen was closed and the patient returned to bed in good condition. Her postoperative course was uneventful.

Pelvic examination three weeks and six weeks postoperatively showed no pelvic residua and the patient has had no further pelvic complaints. Her menstruation has been re-established and has been normal.

Case No. 2*

A white female, age 28, was admitted to hospital on May 4, 1949, complaining of vaginal bleeding for the past 14 days, fever and chills for two days, lower abdominal cramps for 14 days. Her last menstrual period was February 14, 1949, but in March she had some spotting when her period was due but had no regular menstrual period. The spotting then continued until the present illness.

On April 18, she consulted one local doctor who found her to have a temperature of 100° and to have evidence of a pelvic inflammatory disease. She was treated by one injection of penicillin, 300,000 units, and asked to return but did not do so.

She said that on April 20, she had fallen down eight stairs, and that after this fall the spotting became slightly more marked. She had gone to bed and remained there until the day of admission. On May 2 she began to have lower abdominal cramps which became bearing down in nature the following day when she found her temperature to be 103°. On May 4, 1949, she consulted a second local doctor by telephone who referred her to the Minneapolis General Hospital. This second doctor reported that the patient had told him by telephone during early April that she had not tried to abort herself, but that she intended to do so with a catheter. The patient gave no definite history of induction either medical or mechanical.

The patient said that she was very nervous and that she has had two nervous collapses. Other past history was negative. There was no weakness or paralysis of extremities. She had had three full-term normal pregnancies and deliveries, and three induced abortions. She had had two severe attacks of pelvic inflammatory disease and an appendectomy had been done in 1934. Her family history was essentially negative.

Examination on admission showed an extremely toxic and acutely ill 28-year-old white female, bleeding moderately from the vagina, with temperature of 103.6°, pulse rate of 120, and with blood pressure 140/76. Examination of the abdomen revealed generalized lower abdominal tenderness. No rebound tenderness or muscle spasm was apparent; no masses were palpable. The liver, kidneys, and spleen were not palpable, and the bowel sounds were unusually quiet.

The pelvic examination performed at this time showed a parous outlet with adequate levator ani and perineal support. The anterior and posterior vaginal walls were adequately supported and the external genitalia negative. The cervix was soft and bluish and the external os was ½ cm. dilated with a slow ooze of dark red blood. No tenaculum marks or evidence of trauma were seen. Vaginal mucosa was bluish and succulent. The corpus was soft in consistency, anterior in position, and about the size of a two months' gestating uterus. There was generalized tenderness of the corpus and the adnexae but no definite masses were distinguished. The clinical impression was that of infected imminent early abortion.

Laboratory tests on admission showed a hemoglobin of 74 per cent, white blood count of 1,900 with 90 per cent neutrophiles and 10 per cent lymphocytes. Urinalysis was entirely normal and Wassermann test was negative.

At 3:30 A.M. on May 5, 1949, the patient spontaneously aborted fetus and secundines intact with only moderate bleeding. The specimen consisted of the placenta 14 cm. in diameter with amniotic sac and fetus intact. The fetus, a male, measured ten cm. in length. No gross abnormalities were seen. Microscopic sections showed chorionic villi and decidual tissue as well as clotted blood. Portions of this tissue were undergoing degenerative changes and some portions contained very dense PMN exudate. Clumps of bacteria were also seen. A diagnosis was made of infected placenta undergoing degenerative and suppurative changes.

Following the abortion, the patient's blood pressure dropped to 72/60, her pulse was rapid and she appeared to be in shock despite the fact that there was very little blood loss. One thousand cubic centimeters of whole blood was given with the second 500 cc. forced in under pressure. She had previously received 2,000 cc. of 5 per cent glucose in distilled water plus 500 cc. of blood at the time of admission when a blood culture was taken.

At 6:30 A.M. the blood pressure was unobtainable and the pulse thready; the patient was cyanotic. There were moist râles throughout the chest. Shock blocks previously placed were removed and oxygen was administered.

A second blood culture was taken at this time. The patient had already been placed on penicillin at the time of admission. An emergency x-ray film of the chest revealed evidence of pulmonary edema.

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At 8:00 A.M., with the blood pressure still 70/50, digitalization was started with 4 cc. of cedilanid at this time. Dihydrostreptomycin, one gram q.i.d. was given intramuscularly and penicillin, 1,000,000 units B.I.D., was administered intravenously.

The clinical impression at this time included (1) infected abortion with septicemia; (2) acute left heart failure following forced fluids; and (3) pulmonary edema. This impression was strengthened by the finding of petechiae over various parts of the body.

An electrocardiogram obtained on the afternoon of May 5, 1949, showed digitalis effect and certain other abnormal changes not clearly interpreted, but nothing definitely indicating coronary thrombosis or pulmonary infarct. The blood pressure remained 70/50 until mid-afternoon, twelve or more hours, when it rose gradually with a very slow administration of blood plasma. The clinical signs of pulmonary edema cleared up gradually during the day but the x-ray film of the chest taken during the afternoon of May 5, 1949, showed pulmonary edema with pulmonary effusion on the right side.

The patient received oxygen continuously all day May 5, 1949, and was lucid but extremely apprehensive all day. By evening she was markedly jaundiced.

Laboratory studies performed early in the morning on May 5, 1949, showed hemoglobin 112 per cent, 29,000 white blood count with 98 neutrophiles and two lymphocytes. This marked rise in white blood count is a great change from the admission white blood count of 1,900 which was double checked by a senior technician. The mid-day hemoglobin was 112 per cent, 21,000 white blood count, with 97 neutrophiles and two lymphocytes. Bleeding time was four-and-a-half minutes; clotting time three minutes. Patient's prothrombin time 17.0, control 11.8. Sputum smear showed a few gram positive rods. Cervix and urethra smears on admission were negative.

The blood pressure rose gradually to 96/70 by morning of May 6, 1949, and the patient was breathing more normally and was less apprehensive. After that it rose from 90/60 on May 6, to 110/60 and from the seventh on, blood pressure was stable within normal limits.

The uterus was about two times normal size on May 5, 1949, anterior in position, soft and diffusely tender. There was no evidence of pelvic abscess and no definitely indurated areas. The urinary output during the period of shock was adequate. Analysis of the urine revealed it to be negative for urobilinogen but positive for bilirubin. The blood culture taken May 5, 1949 was reported as containing gram negative rods culturally characteristic of aerobacter and another unidentified rod.

Laboratory reports of May 6, 1949 showed: BUN 16 mgms. per cent; cholesterol 190 mgms. per cent; Van den Bergh one minute, 1.1 mgms. per cent and total 3.7 mgms. per cent. The total plasma protein was 6.7 grams per cent.

The cedilanid was continued on May 6, 1949. At 2:00 P.M. the pulse was 88, blood pressure, 100/55, and respirations 24. Physical examination of the chest revealed a definite decrease in the findings indicative of pulmonary edema. The entire clinical picture gradually improved from this day on and the temperature remained normal.

The cedilanid was discontinued on May 9, 1949 and the dihydrostreptomycin was reduced to 0.5 grams t.i.d. and the penicillin to 200,000 units intramuscularly every three hours. The BUN, total proteins, fractional proteins, and blood chlorides all remained within normal limits. A further report on the blood culture taken at the onset of the episode revealed E. coli. An x-ray film of the chest on May 9, 1949 revealed no evidence of pulmonary edema. On May 12, no signs of pulmonary edema were found.

A bimanual pelvic examination and speculum examination was carried out every other day and no evidence of induration, abscess or hemorrhage was found. Patient was allowed up and about on May 12, 1949 and has continued to be up and about without complaints. The hemoglobin remained about 95 per cent and white blood count and differential were normal after May 9, 1949.

The only positive finding on pelvic examination of May 16, 1949, was moderate diffuse adnexal tenderness bilaterally plus a palpable right tubo-ovarian mass approximately 4x5 cm. in diameter and a thickening but no definite mass in the left adnexa. Both of these findings were present on an admission in October of 1948.

The patient started to take a liquid diet on May 6, 1949 and by May 9, 1949 was taking a high protein, high carbohydrate diet. Her weight on May 15, 1949 was 114 pounds. Her usual weight was 115 pounds.

On May 20, 1949 patient was ready for discharge with the positive findings of a chronic low grade pelvic inflammatory disease which was present in October, 1948. The diagnosis on discharge included: (1) early infected complete abortion; (2) septicemia (E. coli cultured); (3) acute pulmonary edema, and (4) low grade residual pelvic inflammatory disease.

This patient never admitted induction relative to this present abortion but has had previous admitted self-induced (mechanical) abortions and threatened to induce an abortion on this present pregnancy to her private physician.

I believe that the large amount of intravenous fluid administered to the patient during the first 12 hours of hospital stay plus the fact that 500 cc. of blood was pumped in under pressure was the cause of the pulmonary edema and was an unwise procedure. She probably was suffering from medical shock due to an overwhelming septicemia. We cannot accurately say what controlled the infection since the patient received both penicillin and dihydrostreptomycin.

Foreign Body in the Abdomen Coexisting with Ruptured Ectopic Pregnancy*

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An unusual combination of a foreign body in the abdomen and a coexisting ruptured ectopic pregnancy, make this case worthy of reporting.

Foreign bodies left in the abdomen following surgery are not new or rare. Many cases are on record depicting all kinds of sponges and instruments that were left in the abdomen after operation. This constitutes a serious accident and the complications and sequelae might be disastrous. Schachner states, "So long as surgery continues an art, just so long will foreign bodies continue to be unintentionally left in the abdominal cavity."

Findley states, "In former years the abdominal surgeon was seriously disturbed by well-grounded fears of secondary hemorrhage and sepsis, but surgery has mastered these problems to a large degree and they are little feared and seldom experienced. Now it is the thoughts of the sponge that disturbs the night's repose when the report comes that something has gone wrong with the patient. The operator never can rid himself of the feeling of uncertainty as to the possibility of leaving a sponge."

Today, too, such accidents occur in various institutions, both big and small, well organized and mediocre.

Case Report

This colored female was age 33, para 4; was admitted to Ward 40, Cook County Hospital, on January 23, 1948. Her complaints on admission were enlargement of the abdomen for the past 15 months, amenorrhea for the past two months, and a pain in her back and side for the past two weeks.

The patient stated that for the past 15 months she had noticed her abdomen was growing larger. Her last normal menstrual period was in November, 1947, and on December 13, 1947, she spotted for one day. There was no further bleeding until January 19, 1948, when she started spotting again and since then had been spotting off and on. For the past month she had had a slight whitish discharge. She has had no pain until the previous two weeks when she started having sharp pains in the lower abdomen which were not constant, but like labor pains. An Aschheim-Zondek test to determine pregnancy was performed in May, 1947, in California and she was told that it was positive. Her history showed that she had had a cesarean section performed in June 1946 for placenta previa. Her first three deliveries were spontaneous.

Physical examination revealed blood pressure 120/80 and pulse 72. Examination of the abdomen revealed a mass which extended to two finger breadths above the umbilicus which was smooth, somewhat cystic, and not tender. Vaginal examination revealed a multiparous introitus, Bartholin's, urethra, and Skene's negative. The cervix was pointed posteriorly, moderately firm, os closed and tender to tintillation. Corpus was anterior and upper limits of normal size. Beneath the uterus was a cystic mass which filled both fornices and extended to two fingers' breadths above the umbilicus. Speculum examination showed a lacerated cervix, and Chadwicks negative. Temperature on admission was 100° F. The condition at that time seemed to indicate an ovarian cyst with a possibility of an abdominal pregnancy. An Aschheim-Zondek test was performed and was negative. Flat plate of the abdomen showed no evidence of fetal parts; there was evidence of a soft tissue mass extending out of the pelvis to the level of the fourth lumbar vertebrae. The urine examination was negative; Kahn negative; hemoglobin 83 per cent; white blood cells, 7,200. The patient was afebrile after the day of admission.

A laparotomy was performed on February 3, 1948. The abdomen was opened in layers down to the peritoneum which was contiguous with the abdominal mass. On opening through the wall a large amount of yellow pus poured out, so the incision was enlarged to about three inches in length and the cavity explored. On exploration *a large lap pad was found and delivered,* with the uterus in normal position anterior and upper limits of normal size. To the right and posterior to the uterus a cystic mass was palpated, approximately seven centimeters in diameter. It was thought that this mass in the right lower quadrant was probably a loculation of the larger abscess, and since it seemed advisable to leave well enough alone the abdomen was closed in layers.

The blood pressure following surgery was 90/50 and the pulse rate was 88. The patient was started on penicillin 100,000 units Q 3H. On the following morning, February 4, 1948, her condition was good, with blood pressure 120/80; pulse, 84; hemoglobin, 90 per cent; W.B.C. 11,150. At 8:30 P.M. she suddenly went into shock and her pulse was imperceptible. She was placed in Trendelenburg position and intravenous fluids started, including 1,000 cc. of plasma while patient was being typed and cross matched. Nasal oxygen was also started. Blood pressure at this time was 40/0. Her condition appeared to improve and at 11:30 P.M. her pulse was 116, and blood pressure 80/50. It was noted that her abdomen was slightly distended and there was some bulging of the flanks. The impression was that the patient was bleeding internally. Despite the fact that the patient had already received 1,000 cc. of blood, it was noted at 2:30 A.M. on February 5, 1948, that she was not quite as well as previously. Her pulse was 128 and thready. On pelvic examination a soft bulging mass was felt in the cul-de-sac, and an exploratory laparotomy was decided upon.

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The abdomen was opened through the previous incision. The abdominal wall abscess had now shrunken down so that it formed a sac approximately 4 cm. in diameter. By extending the peritoneal opening the abdominal cavity was entered. Approximately 1,500 cc. of blood was present in the abdomen, which was aspirated. A ruptured ectopic pregnancy (right), was then found, of approximately three months gestation. A right salpingectomy was performed and the area peritonealized. On further examination it was found that the sigmoid was adherent to the abscess wall and it was freed. The operation was performed under nitrous oxide and ether. The wound was closed with wire through and through sutures. The postoperative condition of the patient was good with blood pressure 124/90 and pulse 88. The postoperative course was uneventful, and the patient was discharged on February 27, 1948.

Pathological report described a cloth pack measuring 25x30 cm., discolored, and a dirty green-gray ectopic pregnancy.

Summary and Conclusions

1. History of amenorrhea, pain and spotting must alert one to a possible ectopic pregnancy irrespective of findings on examination.

2. The cystic, fluctuant mass in an afebrile patient made the differential diagnosis elusive; the presence of an abdominal scar, however, should make one think of a possibility of a foreign body.

3. The removal of the foreign body and evacuation of the abscess was thought to be sufficient to take care of the patient's symptoms and findings.

4. One should always be alert as to the possible presence of *combinations* of pathologic conditions in the same patient.

Reference

Crossen and Crossen: Operative Gynecology. 1948.

MINNESOTA CANCER CENTER GIVES TWO YEAR REPORT

Physical abnormalities requiring medical attention were found in more than one-half of the 3,265 examinations conducted in the University of Minnesota's Cancer Detection Center during the first two years of its operation. Cancer in some form was detected in 34 visitors to the center, 15 men and 19 women. Thirty cases of cancer were diagnosed on the first visit, while four persons were found to have developed a malignancy when they returned to the center for their prescribed annual recheck.

In the 1,732 examinations (53 per cent) which revealed ailments or physical defects requiring medical attention, doctors assigned to the center found, in addition to the 34 definite instances of cancer: 776 pre-cancerous conditions which, if not promptly treated, might turn into cancer; 564 benign (non-malignant) tumors; and 2,149 instances of abnormal medical conditions, non-cancerous (such as high blood pressure and hemorrhoids) but calling for immediate treatment.

The center is open to Minnesota men and women in the age bracket in which cancer occurs most frequently, 45 and over, who are unaware of any symptoms of cancer in themselves. Admission to the center is by appointment only and to date more than 21,000 applications for appointments have been received.

Threatened and Habitual Abortion*

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The prevailing high incidence of abortion bespeaks an inadequacy in our methods of treatment. Undoubtedly this is due in part to faulty knowledge of the causes and mechanisms involved; some are understood, others remain conjecture. It may be argued that developmental deficiencies in the embryo set the stage for many abortions, and in these the fatal outcome would seem to be fortuitous. Even so, opportunities lie in preventing their inceptions. With recent knowledge, improvements have been made in some phases of management. It is the aim of this presentation to review these advances and discuss present day concepts of etiology and therapy.

The reported incidence of abortion varies from 10 to 47 per cent; the clinical figure often quoted is one abortion in every five pregnancies. For purposes of discussion an abortion is the termination of pregnancy, as ruled at the New York Lying-In Hospital when the fetus weighs less than 500 gm., or according to Streeter at or before 22 weeks gestation. Habitual abortion is said to exist after three such episodes. The treatment, and presumably the etiology, of threatened abortion in the occasional case and of habitual abortion, are no different and will be considered together.

PREVENTION

Relevant to the discussion are the occurrence of defective germ plasm in fertilized eggs, and faulty implantation. It is now well established by Hertig and Rock[1,2] that nearly half of all early conceptuses are abnormal and will abort; in turn half of these are so defective they will even fail to implant, and consequently abort very early. Also of significance is the finding that nearly all, if not all, inevitable abortions implant on the anterior wall of the uterus. That treatment of this group is of avail, is very doubtful. Fortunately, in our experience, there is no greater likelihood of an abnormal fetus being carried to viability with treatment, than in the non-abortion group.

To prevent such abnormal development, treatment must be employed prior to conception. The result will be healthier ova and sperm, as well as a healthier endometrial environment for implantation of the fertilized ovum. While it was formerly our practice to place emphasis on semen analysis, particularly sperm morphology, it now appears that no significance can be attached to such physical properties. The basal metabolic rate should be determined in both parents, and if low corrected with dessicated thyroid. Good nutritional state of the two partners can be achieved with proper diet augmented with vitamin-mineral supplement. Underlying nervous and physical problems should be corrected. Prophylaxis has also been undertaken with pre-conception progesterone therapy. By administering progesterone, 5 mg. every other day from 18 days premenstrual through the fourth month of gestation, Rutherford[3] was able to obtain viable babies in 31 of 54 habitual aborters. However, other measures were combined in therapy and so obscure results credited to the hormone.

Perhaps related to the occurrence of defective fertilized eggs, and significant to our better handling of abortion cases, are the statistics on abortion rates in subsequent pregnancies. It has been established[4] that where the interval is less than 12 months from the previous pregnancy, the abortion rate is 40 per cent, that is four times the normal rate in intervals beyond the first year.

PHYSICAL FACTORS

Travel in the first trimester is generally discouraged on the contention that it may increase the abortion hazard. While we have all seen individual examples of this, yet when considering large groups of cases it may not be important. During the recent war a study was made at the Naval Station at Key West,[5] comparing abortion rates of pregnant women who stayed there, with another large group who traveled. Surprisingly, the abortion incidence was no greater in the travel group; however, it might be argued that only those women traveled who were in good health and without evidence of threatened abortion or previous abortion history. From personal observation it is apparent that travel does increase the risk of abortion. Certainly this is true in women who have had some bleeding earlier in the pregnancy. Accordingly, travel is discouraged in the early months of gestation, with the reservation that if it is necessary then plane or train means are preferred to car or bus.

Bed rest in the first trimester has been shown ineffective in treatment of habitual abortion. Continuation of reasonably cautious ambulant activity is advised, save for patients with threatened abortion. Here we all agree that bed rest is desirable. A usual supplement to this is the administration of phenobarbital or some other sedative.

Coitus and pelvic examinations carried out during the first three months may precipitate abortion in predisposed patients. Many obstetricians including the late Dr. H. J. Stander routinely defer bimanual pelvic examination until the fourth month for this reason.

Other physical factors which contribute to abortion are uterine retroversion and myomectomy. Javert, Finn and Stander[6] found a much higher incidence of retroversion in their abortion cases than in controls. Correction is best carried out by manipulative measures either prior to pregnancy or before the second month in habitual aborters. The suspension operation is not necessarily the answer, for cases have been reported of secondary habitual abortion developing following the operation. Where women have had previous myomectomy, the abortion rate is 33 per cent. In contrast, previous cervical operations do not increase the abortion risk.

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*Read at the meeting of the Four County Medical Society, Rice Lake, Wisconsin, November 9, 1948.

Infantile uterus and genital hypoplasia may also be included in a listing of etiologic factors. Kurzrok,[8] Peterson,[9] and others feel such is a cause of abortion, and treat the condition empirically with estrogen, progesterone and thyroid. Such a theory, however, must be cautiously accepted. Developmental failure is more likely to result in amenorrhea and infertility.

The occurrence of late pregnancy bleeding and premature delivery seems to have more than coincidental relation to threatened abortion. Accordingly, one may surmise that some cases of abortion are due to very early premature separation of the placenta and/or placenta previa.

HORMONE AND DIETARY FACTORS

Endocrine and vitamin deficiencies have been given main emphasis in explaining the occurrence of abortion. Consequently much of the therapy has been along these lines.

The majority opinion would seem to favor use of progesterone as the important drug in treating threatened and habitual abortion. Such view has been based on studies indicating that the drug has a quieting effect on uterine contractions. (In clinical experience, however, its effectiveness in many cases is questionable.) It is customarily given in 20 to 50 mg. daily dosage during and after threatened abortion until production of the hormone by the placenta is on a substantial plane, i. e., the fourth month. To this may be added estrogen, as proposed by Vaux and Rakoff.[10] It is felt a synergistic action results which will offset an early corpus luteum deficiency in these cases. Treatment of course should be started early, and in habitual abortion as soon as pregnancy is determined.

The basal metabolic rate should be determined routinely. If low, as occasionally found in threatened and habitual abortion, it should be corrected with dessicated thyroid. While some will treat all cases with thyroid, it seems preferable to use the drug only in those cases where it is called for by lowered metabolism. In handling these problems, we regard as subnormal as little as a minus five or six per cent.

Some speculation is given to lowered pituitary gonadotropic hormone levels as an underlying cause of faulty corpus luteum formation. We have had no experience with replacement therapy, and I know of no reliable reports concerning its effect in treatment of threatened abortion.

The Cornell group is strongly in favor of dietary and vitamin treatment. In brief, this consists of diet high in citrus fruits, fresh vegetables, minerals, and dietary supplement including vitamin C, 50 mg. three times a day, and vitamin K, 5 mg. daily. Attempts are being made to evaluate the effectiveness of individual factors. However, it seems unwise at present to draw conclusions from comparative studies with very small control series, and from blood analyses which may be open to question. The results of such combined therapy, however, are most encouraging, and treatment along these lines merits general acceptance.

Finally, one should include for completeness in the list of causes of abortion such remote factors as: psychological disturbances, diabetes, alcohol, lead and nicotine intoxication. Syphilis does not cause abortion, nor does Rh incompatibility.

SUMMARY

Treatment of threatened abortion, either habitual or single case, must be based on correction of a multiplicity of factors. Some are known, others implied. Unfortunately much of our treatment remains empirical. In summary, the following outline of treatment may be recommended, as reasonable, in the hazy light of our present knowledge of the mechanism of abortion:

1. Ambulation is permitted unless there is vaginal bleeding. Restriction of activity is then required, and bed rest in the hospital is preferred.
2. Regular bowel function must be maintained, if not through diet, then by gentle acting cathartics and/or by occasional warm water enemata.
3. Coitus, travel and bimanual pelvic examinations are interdicted.
4. Dietary supplement, preferably a multiple vitamin-mineral formula, is prescribed in double the daily minimal requirement. In addition, 200 cc. of fresh orange juice, five mg. of vitamin K, and 50 mg. of mixed tocopherols are given daily.
5. Oral progesterone* and estrogen† are routinely employed.
6. Where the basal metabolism is lower than a minus five per cent, dessicated thyroid is ordered in supplemental amounts to correct the deficiency.

Under such management one may hope for decided improvement in three or four days. If this is not forthcoming, we do not hesitate to perform a vaginal examination on the presumption that the abortion is inevitable. In the event of improvement, examination at an early date is mandatory to exclude non-abortal causes of bleeding, especially carcinoma of the cervix.

It is well to bear in mind, in conclusion, that probably the best treatment of abortion is the prophylactic one. The aim should be to improve the general health of both partners before conception, and to have adequate spacing of pregnancies. The treatment of so-called "threatened abortion" is often, though not always, unsatisfactory because of the frequency of defective germ plasm, and the fact that the fetus may have already died prior to the onset of symptomatic bleeding.

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*Proluton-Buccal tablets, 10 mg. twice daily. (Schering Corp., Bloomfield, N. J.)

†Premarin tablets, 1.25 mg. daily. (Ayerst, McKenna and Harrison, Ltd., N. Y., N. Y.)

(Continued on page 231)

Two Unusual Conditions in Gynecologic Practice

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A LARGE OVARIAN CYST

Mrs. W. S. J., age 78, white, a housewife, married 58 years, and the mother of two children, was referred to me by Dr. C. E. Dutton on August 3, 1940. She was five feet, six inches tall and weighed 235 pounds. She stated that she had never had any serious illness, but during the last 17 years her abdomen had gradually increased in size. She had had no pain or discomfort until the last four weeks following a fall on her abdomen. After this fall she had difficulty with urination for a week. She had had some shortness of breath and on account of the size of her abdomen had not been able to walk about the house. The past five years she had not seen her feet when standing. She had not been able to lie in bed for several months.

Physical examination showed the patient to be an emaciated elderly woman with an enormously distended abdomen. There was edema of both legs below the knees. The costal margins flared outward from intra-abdominal pressure. The following measurements were made:

	Level of Nipple	Xiphoid	Umbilicus	Hip Joint	Pubis to Xiphoid
Prone	37″	40″	64″	57″	35″
Standing	37″	39″	62″		35″

The abdomen was tense, fluctuation was present. There was no bulging of the flanks. The urine had a specific gravity of 1.024, with a faint trace of albumin and no sugar. Microscopic examination showed 3 to 4 pus cells per l.p.f. Blood examination showed hemoglobin 72 per cent; RBC 3,830,000; WBC 8,100; PMN 78 per cent; and lymphocytes 22 per cent. Bleeding time was two minutes, 45 seconds, and coagulation time, was two minutes.

Under novocaine infiltration a 1½ inch incision was made 2 inches above the umbilicus. The peritoneum was densely adherent to the cyst wall. A trochar was introduced and part of the fluid was evacuated, totaling 88 pints and weighing over 88 pounds. Three distinct cavities of the cyst were evacuated: one containing about 68 pints; one, 16 pints; and one, four pints of fluid. A tumor of considerable size remained after the evacuation of the fluid. The fluid was of the color and consistency of a thick bean soup. The following morning the patient weighed 147 pounds.

On April 14, 1941, the patient's abdomen was almost as large as at the time of her admission to the hospital. Circumference at the umbilicus was 62 inches. She was again having difficulty in breathing. She was again tapped and 50 pints of fluid removed. On September 11, 1941, the abdomen was greatly distended and over 88 pints of fluid removed. On December 9, 1941, the abdomen was again greatly distended and 40 pints of fluid were removed.

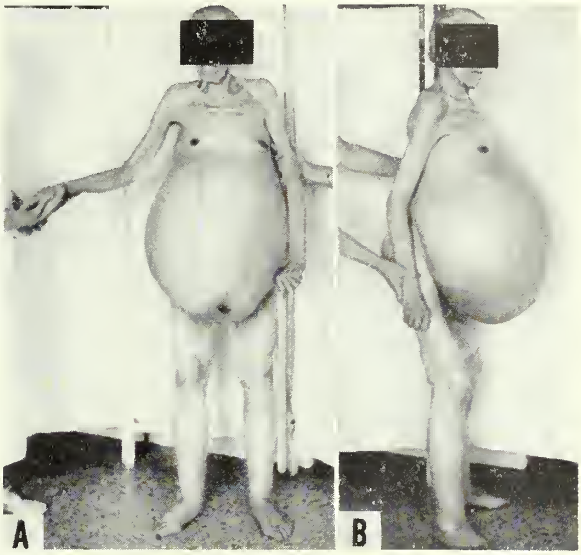

Fig. 1. Ovarian cyst. A. Front view. B. Side view.

The patient's physician stated that she died late in December, 1941, from cardiac disease. No autopsy was permitted. The patient refused at any time to permit an operation for removal of the cyst.

It is a popular impression of the laity that large tumors are the result of the patient's inability to get medical care. The four largest pelvic tumors I have had the opportunity of observing occurred in women who had lived most of their lives within a mile of modern hospitals with charity services.

FOREIGN BODY IN UTERUS

Mrs. J. W., age 51, white, housewife, married 22 years and mother of one child consulted me regarding a recurrent urinary tract infection and also wished to have a "platinum ring" removed from the uterus. She had not menstruated for three years. Ten years ago, when she had consulted a physician to obtain contraceptive information, she was advised to have a platinum ring inserted into the uterine cavity and the procedure was carried out.

On June 9, 1941, under gas anesthesia, the cervical canal was dilated and a sound passed into the uterine cavity. A metallic object was felt in the fundus of the uterus. This was grasped with a cystoscopic alligator forcep and was removed in numerous pieces. A dull curette was introduced but no foreign material obtained. The uterine cavity was then packed with gauze which was withdrawn but no foreign body could be found in the gauze.

X-ray examination after the operation showed no evidence of any metallic body remaining.

The Coexistence of Diabetes Mellitus and Diabetes Insipidus

Report of Case with Two Successful Pregnancies

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The coexistence of diabetes mellitus and diabetes insipidus is indeed very rare. About 36 cases have been reported to date, eight of which were found in the United States.

Case Report

Mrs. L. S. S., 20, was first seen by the senior author on November 13, 1939, when she was about two months pregnant. She stated she had had diabetes inspidus for the past 16 years, but otherwise had been in good health. Her fluid intake and output ranged from four to six gallons every 24 hours. Her sleep was disturbed hourly by her thirst and frequent urinations. Her appetite was very good. She weighed 103 pounds. Her blood pressure was 120/75. At this time urinalysis revealed a specific gravity of 1.000, no albumin, but a glycosuria of 4 plus. She was instructed to limit her dietary intake of carbohydrate, and a week later the urine was sugar-free and continued to be free of sugar for the next three months. Then, during the fifth month of pregnancy, insulin injections were begun to aid in controlling the glycosuria. After this her weight gradually increased to 123 pounds. However, the last month she gained 21 pounds, making a total weight gain of 41 pounds. Her blood pressure remained within normal limits during the prenatal period, and at no time was albumin found in the urine.

About two weeks before the calculated date of delivery the patient became restless, confused and stuporous and was taken to the Swedish Hospital. On admission at midnight she was markedly edematous with a blood pressure of 150/90. She was unable to void, but a liter of urine was obtained per catheter, and showed specific gravity of 1.000, no sugar present, and a positive test for albumin (3 plus). Since she was in labor, but not making much progress, one dose of four minims of pituitrin was given hypodermically without much effect. Sodium amytal in three grain doses was given rectally for restlessness, also with little effect. By morning the patient's blood pressure was 188/110. Although she appeared moribund the condition of the fetus was still good. Therefore, on May 25, 1940, under cyclopropane anesthesia with one ampule each of lugalin and coramine as premedication, a classical cesarean section was made to deliver a normal male infant weighing ten pounds, six ounces. To control uterine bleeding one cubic centimeter of pituitrin was injected into the uterine wall, and one ampule of ergotrate was given intramuscularly.

The patient's convalescence was stormy. The edema receded rapidly after the first postoperative day, when the fluid output began to exceed the intake. The maximum output was 18 liters on the fifth postoperative day. Her blood pressure fluctuated somewhat, but remained fairly high for the first week—140 to 160 systolic and 80 to 100 diastolic pressures—after which it returned to normal. On the fifth postoperative day the patient had a severe chill which lasted ten minutes after which her temperature rose to 103.6° F. Thereafter she had chills for several days and ran a septic fever for about a week before it was checked by the administration of neoprontosil. The lochia became foul, and purulent discharge issued from the abdominal wound. On the seventh postoperative day a blood transfusion was given—hemoglobin was 34 per cent after which the patient developed a reaction—a severe chill lasting 20 minutes followed by a rectal temperature of 107.4° F. Doses of sodium amytal were given frequently for marked restlessness, dilaudid occasionally for pain; coramine and digalen were supportive drugs given during the first two weeks of hospitalization.

The infant lost half a pound of weight and had regained two ounces on formula feedings by the seventeenth day when he was discharged with his mother. The mother, on discharge from the hospital, weighed 98 pounds, had normal blood pressure, but had a trace of albumin in the urine. She was to have a non-restricted diet and take 40 units of protamine zinc insulin daily. No attempt was made to control the diabetes insipidus at this time.

In spite of having been advised against future pregnancies, the patient wanted another child. After having regained her strength and having been in good health for five years, she again returned for prenatal care. This second pregnancy was uneventful except for greater difficulty in controlling the diabetes mellitus. She was hospitalized one day during the third month for a severe insulin shock. About a month before delivery she was hospitalized again for restandardization. The blood sugar at this time was 93 milligrams per 100 cubic centimeters, earlier in the pregnancy a fasting blood sugar had been 300 milligrams per 100 cubic centimeters. Earlier in her pregnancy she had required 85-90 units of insulin daily, now she was discharged with instructions to take 30 units of protamine zinc insulin before breakfast and ten units of regular insulin before the other meals if indicated by the test for sugar in the urine. She was to follow a general diet. Her weight gain during this pregnancy was 25 pounds, the blood pressure was normal, and there was no albuminuria at any time.

On November 13, 1945, the patient again entered the Swedish Hospital and the next day was delivered of a normal female infant, weighing nine pounds, six ounces, by cesarean section at which time the tubes were ligated. The patient's recovery was uneventful and both mother and child were discharged in good condition on the tenth postoperative day. Incidentally, a roentgenogram of the skull at this time was reported showing a normal sella turcica.

Her last hospitalization was at Swedish Hospital on May 12, 1946, for insulin shock from which she again recovered rapidly after the administration of intravenous glucose solution.

At the age of 28, the patient on February 18, 1948, complained of nervousness and menstrual irregularity. She was started on weekly injections of estrogen 10,000 units. She was also urged to try whole pituitary orally in two gram doses twice a day in an attempt to control the diabetes insipidus. Although there was some reduction in the fluid intake and output, the patient felt she could not afford to continue this medication.

June 10, 1948, Mrs. L.S.S., 28, was seen for the first time by the junior author. She complained of nervousness, extreme fatigue, fear of insanity, menstrual irregularity for the past nine months, and lack of sexual desire. She stated she had had diabetes insipidus for the past 24 years and diabetes mellitus for the past eight years. Except for severe illnesses associated with the birth of her two children, ages eight and three, she had always been in good health.

Past history. Mrs. S. was the third in order of birth, which was a normal spontaneous delivery at the Minneapolis General Hospital. Her two older sisters are living and well. A fourth sibling, hydrocephalic, died a few hours after birth. At the age of nine months the patient was hospitalized a few days at the Minneapolis General Hospital for a severe upper respiratory infection and a non-specific vaginitis.

When she was four years old she fell down a flight of stone stairs and received a bruise in the right frontal region, a bony "lump" being present at the site to this day. About three months later she developed extreme thirst, polyuria, frequency of urination and enuresis. Her appetite was good, but she lost weight. She had frequent chilly sensations. On July 25, 1924, she was taken to the University Hospital out-patient department where the diagnosis of diabetes insipidus was made and a prescription for a daily dose of one cubic centimeter of pituitrin intramuscularly was given, but never used. About a month later she was admitted to the Minneapolis General Hospital with the same complaints besides loss of appetite. Physical examination at this time was essentially negative. A roentgenogram of the skull was reported: normal sella turcica. Urinalysis revealed: specific gravity of 1.002–1.006, no sugar, no acetone, volume was 4000–7500 cubic centimeters daily, not counting that lost because of enuresis. The polydipsia and polyuria was brought under control by the administration of a dose of half a cubic centimeter of pituitrin intramuscularly twice a day. After five weeks in the hospital she developed diphtheria, which was successfully treated with diphtheria antitoxin. She had had measles, whooping cough and chickenpox before the age of four, and had been vaccinated for smallpox. A week later, when she was discharged, her mother had been instructed to give daily nasal instillations of pituitrin solution, but did not continue the treatment after the initial supply was exhausted.

Except for continual interruptions of activities and sleep because of polydipsia and polyuria, the patient's childhood and adolescent years were years of good health. She has controlled her diabetes mellitus without following a diet, but refrains from excess of carbohydrates. At present she is taking 8 units of protamine zinc insulin and 20 units of regular insulin before breakfast, and about 8 units of regular insulin before her evening meal.

Sexual history. Menses began at the age of 15, were regular every 28 or 29 days with a moderate flow for five to seven days. About nine months ago her periods became irregular varying from 10 to 45 day intervals. After weekly injections of estrogen started five months before and discontinued a month ago her last periods have been regular.

Family history. There are no known cases of diabetes mellitus or diabetes insipidus in the family. However, a grandfather of her husband has diabetes mellitus—a factor of importance for the patients' children, who at present are in excellent health.

Physical examination. The patient appears younger than her 28 years, is small of stature, somewhat underdeveloped, but fairly well nourished. She has good posture and good color. In general she appears cheerful, but lapses into moments of anxiety and fear regarding her condition. She is five feet, three inches tall and weighs 105 pounds. Her temperature, pulse and respiration are normal. Her blood pressure is 90/50. Except for a small bony protuberance on the right frontal bone, the rest of the examination was essentially negative.

Laboratory data. Urine examination showed specific gravity of 1.002, no sugar, no albumin. An examination of a blood sample showed fasting blood sugar 300 milligrams per 100 cubic centimeters.

The patient at this time was urged to try nasal insufflation of posterior pituitary powder in order to give her more rest, especially at night. An attempt was made to allay her fears of impending insanity. Estrogen therapy was discontinued for the time being.

About a month later (July 2, 1948), the patient returned complaining of delayed menstruation. She was again started on estrogen injections of 10,000 units about every ten days. She believes these injections make her feel less nervous and anxious, and her menstrual periods are more regular. With the nasal insufflations of posterior pituitary powder the patient reports she can sleep eight hours through the night without interruption.

DISCUSSION

Diabetes insipidus is a comparatively rare disease characterized clinically by extreme thirst and marked polyuria. It is produced by the lack of the antidiuretic hormone (pitressin) of the posterior part of the pituitary gland (neurohypophysis). This hormone acts on the cells of the descending loops of Henle in the kidney to conserve body water. Any condition which leads to the complete destruction of the neurohypophysis, or its fibers in the pituitary stalk, or in the tuber cinereum, as well as the supra optic nuclei may prevent the formation of the hormone. Besides the idiopathic or possible hereditary factor, trauma of various kinds, mental and emotional shock, primary or metastatic tumors, acute febrile diseases, blood transfusion reactions, tuberculosis, syphilis and xanthomatosis are possible causes. The criterion for diagnosis is the consistently low specific gravity of the urine (1.010 or less) even after forced withholding of water for as long as the patient can tolerate.[2]

Diabetes mellitus is a comparatively common disease, in fact the most common of all the endocrine disorders. It is also characterized clinically by polydipsia and polyuria besides polyphagia with loss of weight. There is an upset in the carbohydrate metabolism of the body because of a deficiency in insulin formation by the islet cells of the pancreas. This may be primarily a pancreatic disease or may be associated with disturbances of the anterior pituitary, the liver and the adrenal cortex. Dietary factors, mental and emotional stress of our times, and severe infections may be predisposing factors as well as direct destruction of pancreatic tissue by tumors or pancreatitis. The criterion for diagnosis is glycosuria with the attendent hyperglycemia and a low glucose tolerance. The specific gravity of the urine is relatively high, 1.025 to 1.030, in spite of a large quantity of pale urine because of the sugar content.

Although rare, the two diseases, diabetes mellitus and diabetes insipidus, may occur in both sexes and at any age. Both may occur simultaneously or be preceded by one or the other. Usually diabetes insipidus occurs first. Instead of continuing simultaneously either may be superceded by the other.

Pregnancy in patients having diabetes mellitus is not as hazardous today as formerly, but is more subject to complications for both mother and child than a pregnancy of a patient with diabetes insipidus. Soule has reported 37 incidences of pregnancy in patients having diabetes insipidus. There is a report in the literature of one patient who bore eight children. Green and Gibson in 1939 reported the first case of pregnancy in a patient having both the diseases. Their 30 year old patient, who was later sterilized, had a normal spontaneous delivery of a full term male infant who died two days later of a cerebral hemorrhage.

The prognosis for patients with the two diseases is largely dependent upon the underlying cause of the diabetes insipidus. Those due to primary and metastatic tumors and xanthomatosis have the poorest prognosis. Those due to tuberculosis and syphilis depend on the out come of the respective disease. Those due to trauma occasionally are spontaneously cured or like the idiopathic may look forward to as long and healthy a life as any normal person. Cases have been reported having had diabetes insipidus 20, 30 to 50 years. Pregnancy usually intensifies the symptoms whereas the menopause alleviates them. Today the life expectancy of patients with diabetes insipidus is modified very little by the coincidence of diabetes mellitus, since with proper care the patients with diabetes mellitus have almost a normal life expectancy. In the case reports prior to the discovery of insulin, the onset of diabetes mellitus in patients with diabetes insipidus caused the death of the patient in about two years.

The accepted treatment for diabetes insipidus today is the use of pitressin injections or nasal insufflation of posterior pituitary powder—the latter being less expensive. Some cases require an increase in the sodium chloride intake to prevent tissue dehydration. Diabetes mellitus is, of course, controlled by diet and insulin. Insulin and pitressin may be combined in the same hypodermic syringe as one injection.

SUMMARY

This case is the second to be reported of pregnancy in a patient having both diabetes insipidus and diabetes mellitus. It is the first in which the infants survived, and the first in which more than one pregnancy occurred.

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Book Reviews

Atlas of Obstetric Technic, by PAUL TITUS, M.D., 207 pages. St. Louis: C. V. Mosby Company, 1948. $7.50.

Especially valuable to the time-short practitioner is an illustrated explanation of many clinical obstetric problems which may be encountered in practice. Dr. Titus' graphic atlas gives the answers to both the rare and common obstetric problems. Step by step techniques are given, providing answers which would otherwise involve wading through pages of detailed explanation in orthodox textbooks. Sections on pelvimetry and sterility are included.

Separate chapters are devoted to minor and major operations during pregnancy. Ectopic pregnancies and abortions are covered adequately. Dr. Titus' book takes nothing for granted, devoting an entire chapter to "Preparations for Labor and Delivery," illustrating a well-equipped delivery table, proper draping, gloving, masking, etc. The illustrations on version and breech delivery are especially good. The most recent trends in obstetric anesthesia and analgesia are also included.

The large format book contains several blank pages for the reader's notes and diagrams. Illustrations are admirably done by E. M. Skackelford. The obstetric specialist will probably find that the book oversimplifies; the practitioner cannot fail to find it a really useful clinical tool. D. J. K.

Haemolytic Disease of the Newborn, by M. M. PICKLES, M.D. Springfield, Ill.: Chas. C. Thomas & Co., 1949. $4.50.

This comprehensive and well-organized monograph on hemolytic disease of the newborn is an excellent evaluation and interpretation of the vast hematologic and immunologic material scattered throughout the medical literature. It is presented in a form which is interesting and understandable to the average medical reader.

The available information on the production, properties, and significance of the anti-Rh antibodies is thoroughly and impartially discussed. The section on treatment is very good, but little mention is made of the possible value of Rh hapten in prevention and therapy of erythroblastosis fetalis except to express doubt with reference to its probable effectiveness. One feature of particular interest is the appendix which is devoted to the tests used in detection of anti-Rh antibody, typing of Rh bloods, and the determination of the genetic factors involved.

The author discussed the important features to consider in giving advice to parents on the wisdom of future pregnancies, and offers suggestions to physicians in evaluating the possible outcome of such pregnancies once they are in progress. All of the features mentioned, in addition to a well-written chapter on the clinical diagnosis and pathologic changes characteristic of the disease combine to form a valuable addition to the literature on hemolytic disease of the newborn. The book is highly recommended to all pediatricians, obstetricians, and general practitioners actively concerned with diseases of the newborn infant. W. H.

Recent Advances in Physiology, by W. H. NEWTON. 7th edition. 268 pp., 32 tables, 90 figures. Philadelphia: The Blakiston Company. $4.50.

Physicians will find several valuable critical summaries of knowledge in clinical physiology in this book. Cardiac catheterization, the relation of the kidneys to hypertension, the physiology of pregnancy, and diabetes insipidus are especially well presented. This volume, like its predecessors, takes up special segments of the field for review, discussion and evaluation of experimental data. The author, who is the Professor of Physiology at the University of Edinburgh, has made a real contribution to one of the major needs of medical science at the present time, namely, the bringing together of the loose bits of experimental data and the fitting of the pieces into a coherent picture. M. B. V.

Year Book of Drug Therapy, 1949. Edited by HARRY BECKMAN, M.D., Director of Department of Pharmacology, Marquette University School of Medicine. 712 pages, illustrated. Chicago: Year Book Publishers, Inc., 1950. $4.75.

A new subject has been added to the 50-year-old series of Year Books, one on drug therapy by Harry Beckman. The stated purpose, as of all Year Books, is to offer the important annual contributions in treatment of disease by drugs. The editor is eminently qualified for this project; he has demonstrated in his justly popular textbook his common sense in therapeusis.

Perennial Year Books of drug therapy should bridge the gaps between editions of the definitive text. Material includes abstracts concerned with evaluation of efficacy of antibiotics, biological preparations, hormones and vitamins, in addition to substances generally considered as drugs. Actual editorial comments enhance appreciably the worth and usefulness of the book to a busy practitioner. J. B. C.

Clinical Audiology, by MAURICE SALTZMAN, M.D., assistant professor of otorhinology, Temple University School of Medicine. Introduction by GEORGE W. COATES, M.D., chief editor, Archives of Otolaryngology. Foreword by MATHEW S. ESNER, M.D., Professor and Head of Department of Otorhinology and Rhinoplasty, Temple University School of Medicine. 195 pages including index and 82 illustrations consisting entirely of audiograms. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, New York, 1949. Price $5.00.

This treatise, which is practically a pioneer one in this field, is not an exhaustive treatment of the subject but might better be regarded as a synopsis or summary. It will probably be criticized because it is not more inclusive. Others will probably debate some of the author's contentions.

The subject matter is treated in five chapters entitled: "Sound and Noise", "Hearing", "Deafness", "Hearing Tests", and "Hearing Aids."

The otologist should find this a useful book to stimulate his thinking and inquiry. The physician who is not an otologist who reads this book will probably end up with the belief that this is a complicated subject. It is, not only to the lay physician but to the specialist in otology as well. L. R. B.

Medical State Board Questions and Answers, 8th edition, by R. MAX GOEPP, M.D., and HARRISON F. FLIPPIN, M.D., 663 pages. Philadelphia: W. B. Saunders Company, 1950. $7.00.

Medical educators are divided into two sharply variant groups over the merits of studying previous examinations. The pro school holds that they serve to guide the student's study and direct his emphasis to important academic channels. The contra group maintains that they symbolize learning not for learning's sake but to "get by" an examination. They feel that no survey of previous examinations is ever justified since a well prepared student should be able to pass any reasonable examination.

However, since in medicine, examinations, like death and taxes, are ever with us, there is probably some justification for Goepp and Flippin's book. The authors do not indicate from which states the examination questions are culled. The questions probably represent an aggregate of previous examinations from several states and are doubtlessly representative questions.

The sections include anatomy, physiology, biochemistry, pathology, bacteriology, materia medica and therapeutics, practice of medicine, surgery, obstetrics and gynecology, hygiene, and medical jurisprudence. All questions are discussion type, and there are no objective fill-in-the-blank samples.

The candidate for state medical boards will probably find the book extremely helpful. Generations of his forebears have used it through seven previous editions, which should establish its merit, even though it fails to settle the controversy and consternation of the professors. D. J. K.

The
JOURNAL
LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatric Society

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Editorials

A SHORT HISTORY OF A STATE SOCIETY

Many of the papers in this issue of the JOURNAL-LANCET have been presented at recent meetings of the Minnesota Obstetrical and Gynecological Society. This organization is now in its thirteenth year and it was thought that it might be of interest to give a brief historical sketch.

The need for an organization for men limiting their work to obstetrics and gynecology was apparent for many years before the Society's inception. In February 1936, at the Town and Country Club in St. Paul, Minnesota, approximately 20 obstetricians and gynecologists of Minneapolis, St. Paul, Rochester, and Duluth gathered to discuss the formation of such a society. Dr. Robert Mussey of Rochester was asked to act as chairman. After considerable discussion it was moved by Dr. Rae T. LaVake of Minneapolis, and duly seconded and passed by those present, that such a society be formed. It seemed apparent that it should be an organization with power to promote interest and progress in obstetrics and gynecology throughout the state. It was also concluded that at the regular meetings held, there should be programs of carefully prepared papers with a free and careful discussion of material presented.

In May, 1936 a luncheon meeting was held in the Sun Room of the Kahler Hotel in Rochester, Minnesota. Again approximately 20 from various communities throughout the state were present. Dr. Mussey was again elected to act as chairman. At this meeting a constitution was adopted which has been in force ever since. With the exception of an interruption for a short period during World War II, there has been a continuous series of meetings with the fall meetings alternating between Minneapolis and St. Paul and the semi-annual spring meetings between Duluth and Rochester. There are now 89 active members, nine associate members from adjoining states, and two honorary members.

In 1945 and again in 1949 the Society sponsored a joint meeting with similar groups from North Dakota, Iowa and Wisconsin. At the 1945 meeting 136 members of the four societies gathered for a one day meeting at the Radisson Hotel. Increasing interest in the meetings as displayed by the papers presented and the larger attendance has more than proved correct the thought held by the original founders of the Society. Everyone interested in this field of medicine is welcome to attend the scientific programs, including the interns and residents in the specialty in the hospitals throughout the state. The JOURNAL-LANCET policy of designating one issue annually as an obstetrical and gynecological issue should be a stimulus to the interest in this specialty for the general reader as well as enhancing the interest of the members of the Minnesota Obstetrical and Gynecological Society in their organization.

JOHN A. HAUGEN, M.D., Secretary-Treasurer,
Minnesota Obstetrical and Gynecological Society

THE IMPORTANCE OF PSYCHIATRIC TRAINING IN MEDICAL PRACTICE

Although the integration of psychiatry and medicine into a new program of comprehensive medical training is not spectacular, Dr. Burtrum C. Schiele, Professor of Psychiatry at the University of Minnesota, says that this approach will have far-reaching effects in medical practice.

"In terms of public health and welfare, the teaching of the principles of psychiatry in such fields as medicine and surgery is a step forward in medical practice," according to Dr. Schiele. "Although the post-war boom in psychiatry and related subjects has stimulated interest in psychosomatic medicine, there must be an integration of psychiatry and medicine. All medical students should be aware of the possible relationship between life situations, personal factors and emotions in physiological upheavals and disturbances."

At any one time approximately half the hospital beds in the United States are occupied by the mentally ill, and at least half the patients of all physicians have complaints caused by or closely related to emotional difficulties. This situation makes comprehensive medicine a vital factor in the mental health program.

LIFE EXTENSION AND "NEED" FOR MEDICAL CARE

None of the states of our union is making as judicious a review of the problems of the aging as is Indiana. This is reflected by the report from Dr. William F. King, director of adult hygiene and geriatrics. He reports that for Indiana "50 per cent of current deaths are due to chronic disease; 6 per cent covered the group then dying 100 years ago." The total of the population over 40 years is now well over one-third and at the level "where chronic disease and disablement appears."

Oscar Ewing (just returned from reviewing the working of the socialization of medicine in Great Britain) suffered a considerable needling from the "Meet the Press" group over a recent radio hook-up. The members sought to get from him some sort of estimate of the *amount* of medical service that would be demanded under a free access system; and of course what it would cost. He parried with the situation that arises from the impact of catastrophic illness. One pressman asked Mr. Ewing (a lawyer) "What about other *catastrophic* costs such as a one hundred fifty thousand dollar legal fee he just experienced?"—and gave other illustrations.

When to the *natural* impediments to comfort imposed by aging, is added the subjective emotional stresses that multiply where the burdens of living pyramid, then it should be appreciated how Dr. King's figures point to the likely *catastrophic* costs of socialized medicine. Watch for various modified plans aiming to limit the field of coverage. But what doctor (not to mention government employee) may venture to determine with individuals as between "a need and a want"? Epicurus is said to have been most liberal with wastrel friends. One such lost courage to approach him again, so sent an intermediary. This understanding agent said to the philosopher of *good living*—"Good sir, as we both know him so well, I pray you do not so much increase his estate as to decrease his desire." We should ask Dr. King to tell us how to *decrease the desires* of capitalists, labor unions, wastrels and neurotics.

E. L. Tuohy, M.D.

MINNESOTA POSTGRADUATE SEMINARS

Minnesota's program of professional education for physicians, dentists, nurses and pharmacists has been successfully inaugurated in Bemidji, Fergus Falls, Duluth, St. Cloud, Winona, Mankato, and Austin. These University of Minnesota Postgraduate Seminars, devoted to heart disease, cancer, and mental health, are planned for a five-year period and eventually will reach most state communities.

The physicians' program consists of eight consecutive weekly meetings, with each evening session approximately two hours in length. As presently organized, there are two lectures each meeting, making a total of 16 for the seminar period. Six lectures are devoted to heart disease, six to cancer, and four to mental health.

Sponsors of the medical courses are the University of Minnesota School of Medicine, the Minnesota State Medical Association, the Minnesota Department of Health, and local professional groups. Lectures are given by faculty members of the University of Minnesota School of Medicine, augmented by eminent specialists in private practice.

The four groups, physicians, dentists, nurses, and pharmacists, hold separate meetings the same day and hour. In some instances the lecturer who addresses one group the first hour moves to the second group for the second hour. Visual aids are frequently used to highlight the lectures.

Professional interest in the seminars has been keen and attendance is uniformly excellent. A good proportion of those invited consistently attended all the sessions, with many traveling considerable distances for each meeting.

With the first five seminars out of seven for the 1949-50 season completed, the remaining two, Austin and Mankato, are in progress and will soon be completed.

Additional co-sponsors of these programs are the Minnesota Division of the American Cancer Society, the Minnesota Heart Association, and the Minnesota Mental Hygiene Society.

Future Meetings

The Western Association of Industrial Physicians and Surgeons invites all American Medical Association members to attend its meeting on Sunday, June 25, 1950 (the day prior to the opening of the A.M.A. convention), from 9:00 A.M. to 5:00 P.M., in the Curran Theater, 455 Geary Street, San Francisco. The program includes: Tetanus Prophylaxis in Previously Immunized Persons, Rodney R. Beard, M.D.; Medical Administrative Problems in Workmen's Compensation Cases, a panel; A Rest Regime for Acute Back Sprain, Christopher Legge, M.D., and Harry W. Walker, M.D.; Psychosis, a Side Door out of Industry, Frank Tallman, M.D.; and Job Placement in the Rehabilitation of Alcoholics, a panel.

* * *

The North Dakota Public Health Association will hold its annual meeting in Bismarck, North Dakota, on November 16, 17 and 18, 1950.

Notices

Information on International Medical Meetings

The United Council on World Affairs has available a list of the international medical meetings to be held during 1950, and some of those scheduled for 1951 and 1952. The Council will be glad to send mimeographed copies of this list on request. The address is 40 Mount Vernon Street, Boston, Massachusetts.

* * *

Fellowship in Rheumatic Fever

The School of Medicine, Western Reserve University, Cleveland, Ohio, has announced the establishment of the Eddie Painton Fellowship in Rheumatic Fever in the Department of Preventive Medicine and University Hospitals. The minimum prerequisites for the Fellowship are one year of clinical work and one year of laboratory work, or two years of clinical training. The Fellowship carries a stipend of $3600 per year.

Applicants should write to Dr. John H. Dingle, Department of Preventive Medicine, School of Medicine, Western Reserve University, Cleveland 6, Ohio.

* * *

Medical Illustrators' Directory Available

The Directory issue of *Graphics*, the official publication of the Association of Medical Illustrators, contains the name, address, training, professional experience and reference to major published work of each member.

The journal, issued on June first, will be available to those requiring medical illustration service, and will be sent, free of charge, upon request to the Editor, Miss Helen Lorraine, 5212 Sylvan Road, Richmond 25, Va.

News Briefs

North Dakota

THE SIXTY-THIRD ANNUAL MEETING of the North Dakota State Medical Association was held in Grand Forks May 27 to 30, with headquarters at the Dakota hotel. The first two days were devoted to business meetings of the council and the house of delegates, and the two final days given over to scientific sessions.

News and announcements from the meeting, as well as from the concurrent meeting of the Medical Auxiliary, will be carried in the July issue of JOURNAL-LANCET, and the full transactions will appear in the September issue.

* * *

DR. DONALD G. ANDERSON of the council on medical schools and hospitals of the American Medical association and Dr. D. F. Smiley of the Association of American Medical colleges were in Grand Forks on April 7 and 8 inspecting facilities at the University of North Dakota. Recommendations for accrediting the medical school are expected to be forthcoming.

* * *

DR. LAWRENCE S. FALLIS, chief general surgeon of the Henry Ford hospital at Detroit, Michigan, spoke on ano-rectal diseases at a meeting of the Northwest Medical Association at Minot, April 27.

* * *

DR. KENNETH MALVEY of Bottineau left April 12 to attend the clinic arranged by the European universities for a group of American doctors representing the Interstate Post Graduate Medical Association of North America.

* * *

DR. JOEL SWANSON, Fargo, Dr. A. E. Culmer, Grand Forks, Dr. J. E. Dyson, Minot, and W. E. LeBien, Fargo, will be on the staff for the crippled children's clinic set for June 5 at Williston, under the direction of the Elks fraternal order and the state welfare board.

New Locations and Appointments . . .

DEACONESS HOSPITAL, Grand Forks, announces the appointment of four staff physicians to the hospital advisory board. They are Drs. A. E. Culmer, K. E. Fritzell, W. A. Liebeler and J. J. Stratte. Dr. Lloyd Ralston was re-elected secretary of the board.

* * *

AFTER nearly 29 years of service to his community, Dr. F. W. Fergusson left Kulm in April for Lodi, Calif., where he will continue his practice.

Dr. Fergusson was chosen president of the State Medical Association in 1941 and has served the state medical society in various other official capacities. He was city health officer for many years and served as county health officer for several terms.

* * *

JOHN G. LADUC, now serving as hospital field supervisor in the Washington, D. C., veterans administration medical office, has been appointed assistant manager at the Minot VA hospital.

* * *

THE PEOPLE OF CARRINGTON recently extended a community welcome to their new physician, Dr. Gutoski, and his family, who came to them from the Ukraine.

* * *

DR. ARCHIE G. GRAY of Langdon was appointed on April 18 to serve as health officer of that city.

* * *

DR. ROBERT C. PAINTER of Dubuque, Iowa, has joined the staff of the Grand Forks clinic as a specialist in internal medicine. A graduate of the University of Chicago, Dr. Painter served his internship in 1941 and 1942 at the Cincinnati general hospital, and after war service he was on the staff of the Mayo clinic in Rochester, Minnesota, for three and a half years.

* * *

DR. JOHN BROPHY, Fargo, has arrived in Garrison to begin practicing medicine with Drs. Hochhauser and Boyle at the Garrison Clinic. A graduate of Northwestern Medical school, Dr. Brophy has been associated with St. Michael's Hospital at Grand Forks, Passavant Memorial Hospital and Children's Memorial Hospital at Chicago.

* * *

DR. J. E. WITTERS left Milnor the latter part of May for Canton, North Carolina to take a position as physician for a large paper company.

* * *

DR. D. H. STEIN arrived in Rolla recently, where he will be associated in practice with Dr. A. M. Miles. Dr. Stein received his medical degree from the University of Toronto in 1947, with an internship at Saskatchewan General Hospital. Just before coming to Rolla Dr. Stein was taking work in surgery in New York City.

Minnesota

ABOUT 80 doctors, dentists and nurses from 15 southeastern Minnesota counties attended the fourth in a series of eight seminars at St. Olaf hospital in Austin on April 5. Speakers included Drs. T. J. Dry, associate professor of medicine and E. A. Banner of the section on obstetrics and gynecology, of the Mayo clinic.

* * *

OVER 150 doctors, dentists and nurses gathered in Mankato on April 4 for the fifth meeting of the Mankato seminar. Dr. L. B. Woolner of the Mayo clinic spoke on "Biopsy in Cancer Diagnosis" and Dr. C. H. Schieffley, also of the clinic, spoke on "Management of Cardiac Failure."

* * *

DR. THOMAS J. DRY of Rochester has been elected the new president of the Minnesota Heart association.

A "MINNESOTA PLAN" of medical advertising was the main topic discussed at the Minnesota State Medical association's second annual statewide press conference held in St. Paul on April 21. Advertising space in Minnesota newspapers will be purchased to "get their story to the public" some 165 editors and publishers were informed by officials of the state association.

* * *

A NEW CLINIC BUILDING opened in Anoka on March 27. Clinic personnel includes Drs. Frank E. Mork and A. Harold Mork; Dr. Thomas Martin, dentist; and Dr. Donald T. Cundy, eye specialist.

* * *

FOUR ROCHESTER PHYSICIANS—Drs. E. C. Elkins, Robert Faucett, Howard Rome and Larence C. Kolb—were on the program of the recent convention of the American Psychiatric Association held in Detroit.

* * *

DR. HENRY E. MICHELSON was elected president of the American Board of Dermatology and Syphilology at the meeting held in Washington, D. C., on April 15.

* * *

DR. RUTH E. BOYNTON was named president of the State Board of Health to succeed Dr. T. B. Magath, who recently resigned. Dr. Boynton has served as director of the Students' Health Service at the University since 1936.

* * *

DR. H. H. RUSS of Blue Earth has been invited to serve as a member of the National Cerebral Palsy Parents advisory council. This council, established in 1946, acts in an advisory capacity in the development of nationwide cerebral palsy program.

* * *

JUST 43 years after he started practice in Bird Island, Dr. R. C. Adams last month announced his retirement as the community's oldest physician and surgeon. Throughout his 43 years in Bird Island, Dr. Adams has been active in social, civic and fraternal activities. He helped organize the Renville County Medical Society and was a member of the state and American Medical Association, as well as the American Railway Surgeons, having served as surgeon for the Milwaukee railroad since 1909.

* * *

LONG PRAIRIE is the first non-metropolitan area in Minnesota to establish a successful, modern blood bank. Nearly 10 per cent of the town's 3,000 residents are signed up to donate blood. About six are called in each week to the clinic which is located in the Long Prairie hospital. With six units of blood always on hand, and about 25 units of plasma, this community is prepared for almost any emergency.

New Locations and Appointments . . .

DR. W. W. CANFIELD has moved from Houston, Minnesota, to St. Peter, Minn., where he has joined the staff of the state hospital.

DR. ROBERT W. WHEELER has joined the staff of the Edina clinic as an ear, nose and throat specialist. He formerly was on the staffs of the University hospital and the Veterans hospital.

* * *

DR. W. W. YAEGER was recently elected chief of staff for the new Louis E. Weiner Memorial hospital at Marshall.

* * *

DR. B. J. BRANTON of Willmar is the new president of the Minnesota Public Health Association.

* * *

DR. H. P. VAN CLEVE, formerly of Dodge Center, has joined the staff of the Austin clinic.

South Dakota

THE 69TH ANNUAL MEETING of the South Dakota Medical Association took place at Huron, South Dakota, May 21 to 23. Business meetings of the executive council and house of delegates were held on the opening day with the following two days set aside for scientific sessions. Presiding chairman for these sessions were Dr. W. H. Saxton, Huron, president of the association, Dr. John C. Hagin and Dr. Merrill W. Pangburn of Miller and R. A. Buchanan of Huron.

* * *

NINETY-EIGHT PHYSICIANS from Sioux Falls and vicinity were present on April 25 when the Sioux Valley hospital medical staff sponsored its annual spring conference. Dr. Anton Hayden, Sioux Falls, presided.

Speakers were Drs. Wilfred J. Hage, Howard Shreves, Emil G. Erickson, Ronald W. Barr, F. C. Kohlmeyer, Warren Anderson, C. Stanley Larson, James Y. Clarke, T. J. Billion, Jr., Robert J. Ogborn, Cloid D. Green, John M. Hermanson and Donald H. Manning.

Discussion leaders were Drs. P. C. VanLier, M. S. Grove, Wallace A. Arneson, William F. Sercl, R. Grove, C. W. Ihle, Jr., Donald H. Breit, Arnold K. Myrabo, Edward Greenough, H. O. Kittelson, L. G. Leraan, Newton Wessman and R. E. Van Demark.

* * *

TWENTY-ONE PHYSICIANS have been named to the first active medical board of St. Ann hospital in Watertown. They are: Drs. J. W. Argabrite, Leon J. Armalavage, H. J. Bartron, Harry J. Bartron, Jr., G. Robert Bartron, H. Russell Brown, J. H. Crawford, Jr., Donald Fedt, R. W. Huber, M. C. Jorgenson, H. T. Kenney, R. M. Kilgard, Myron W. Larson, W. G. Magee, O. S. Randall, T. W. Reul, Maurice C. Rousseau, Mary A. Schmidt, Rodney Stoltz, Stanley J. Walters, all of Watertown, and Dr. Abner Willen, Clark.

* * *

DR. MARY PRICE, general practitioner at Armour for the past five years, was honored with a $1,500 fellowship grant at a recent meeting of the Soroptimists and Venture clubs at Sioux City, Iowa.

Dr. Price will use the fellowship grant for advanced study in obstetrics and gynecology at the Cook County school of graduate medicine, Chicago, Illinois.

DR. QUINTEN SCHERMAN, physician and surgeon at Holy Infant Hospital at Hoven, has received an appointment to a fellowship in obstetrics and gynecology at the Mayo Clinic in Rochester, Minnesota, to become effective on October 1.

* * *

AN UP-TO-DATE study of health needs and resources will be made this year by the South Dakota State Medical association. Its rural health committee, made up of Dr. A. P. Peeke, Volga, chairman; Dr. M. M. Morrissey, Pierre; and Dr. G. J. Bloomendaal, Ipswich, is sponsoring the survey.

* * *

THE TOWN OF PHILIP is looking for a doctor who can operate the community hospital. The board of governors voted to close the hospital May 1 until a new physician has located permanently in the town.

New Locations and Appointments . . .

DR. MAXWELL LIEBERT, a physician from Germany who has been serving an internship at Sioux Valley hospital in Sioux Falls the past year, began practice at Scotland on May 1.

* * *

DR. D. J. GLOOD opened a new office in Viborg on May 1. Dr. Glood came to South Dakota from California.

* * *

DR. HOWARD SAYLOR, son of Dr. H. L. Saylor, has joined his father and the six other members of the Huron Clinic's medical and surgical staff. After practicing in Huron for eight months in 1946, Dr. Saylor received a three year fellowship in general surgery in Rochester, Minnesota.

American College Health Association News

The Ohio College Health Association held its twenty-sixth annual meeting on May 5 and 6 at Kent State University. The secretary-treasurer, William T. Palchanis, M.D., Ohio State University, reported a total registration of fifty-two with twenty-two Ohio colleges and universities represented. Because of the excellent work of the secretary of the section, he was re-elected to this office. The other officers elected were: Ted Allenbach, M.D., Ohio State University, president, and Max L. Durfee, M.D., Miami University, vice-president. The members of the executive committee will be: Russell Williams, M.D., Denison University; Rena E. Coppess, R.N., Wittenberg College; F. P. Bennett, M.D., Mount Union College; Eleonora L. Schmidt, M.D., Ohio University; and E. Herndon Hudson, M.D., Ohio University, ex-officio.

Dr. Irvin W. Sander and Dr. John E. Sawhill, president and president-elect of the National Association, attended the conference.

The program covered a large number of pertinent student health problems. It was organized in the form of round table discussions of current student health problems. Consequently, it included a large number of pertinent problems. The nurses met in one special section to discuss subjects of particular interest to them. A symposium on "Tuberculosis Control on the College Campus" concluded the meeting.

* * *

The Michigan section met in Lansing on May 25 and 26 in conjunction with the meeting of the Michigan Tuberculosis Association.

* * *

The Mid-Atlantic section met at Johns Hopkins University on Friday, May 12. The program included a wide range of subjects. "The Johns Hopkins Student Health Service" and "Athletic Programs" were discussed by Dr. Frank Smith, Jr., Director of Student Health Service, and Marshall S. Turner, Jr., assistant chairman of physical education. Dr. Grace Hiller, director of student health at Goucher College, discussed the "Structure and Aims of the American College Health Association." The following medical problems were presented: "Some Ambulatory Orthopedic Problems"; "The Newer Antibiotics as Applied to Student Health Problems"; and "Radioisotopes in Medicine." Dr. Webb York, Chairman, Department of Health, Princeton University, discussed the subject, "Shall the Facilities of the Student Health Service be Extended to Faculty and Employees?" Other topics included on the program were: "Qualifications Necessary for Successful Hygiene Teaching" by Mr. Clarence Davis, Miner Teachers College, and "Psychological Counseling" by Dean G. Wilson Shaffer, Johns Hopkins University.

* * *

The ninth annual meeting of the Rocky Mountain section was held on May 13th at Colorado College, Colorado Springs. Dr. Roger Whitney, the president of the section, is also university physician at Colorado College. Dr. William Nesbitt, University of Wyoming, gave a report of the American College Health Association meeting held in New York last December. Among others the following topics were presented: "Student Health Insurance," "Treatment of Knee Injuries in a College Dispensary," and "Management of Psychiatric Problems in the Small College."

* * *

Wire Dr. C. R. Lyons, Montana State University, Missoula, Montana, if you are interested in an opening there as associate director of the student health service beginning immediately at a salary of $5,500 to $6,000.

* * *

William R. Nesbitt, M.D., director of student health service, University of Wyoming, has accepted the chairmanship of the committee on local sections.

Deaths

Dr. James Kerr Anderson of Minneapolis died Monday, March 27. Born in East Liverpool, Ohio, July 11, 1891, he received his medical degree from Johns Hopkins in 1917 and came to Minneapolis as an intern at General Hospital in 1917. After World War I he served as superintendent at Pokegama Sanatorium in Deer River and at Sunnyrest Sanatorium at Crookston, and came to Minneapolis in 1929.

* * *

Dr. Olof S. Werner, 84, a member of the "Fifty Year Club" of the Minnesota State Medical Society, died in St. Paul March 24. Born in Sweden, he had practiced for more than a half century in Lindstrom, Center City and Cambridge.

* * *

Dr. Andy M. Carr died March 15 at his home in Minot, North Dakota. Dr. Carr, 59, former eye, ear, nose and throat specialist and with his father, the late Dr. Andrew Carr, a founder of Northwest clinic, had lived in Minot since childhood.

* * *

Dr. John H. Rindlaub, 84, of Fargo, North Dakota, died March 12, 1950. A graduate of George Washington university, Dr. Rindlaub was instrumental in organizing the North Dakota Academy of Ophthalmology and Otolaryngology, and was one of its first presidents. He also was elected president of the North Dakota State Medical society and was a life member of the College of Surgeons.

* * *

Dr. C. H. Johnson, 64, of Spring Valley, Minnesota, died March 16 at Worrall hospital in Rochester. Dr. Johnson had practiced medicine in Spring Valley since 1915.

* * *

Dr. Julius R. Sturre, Minneapolis physician and president of the Minnesota division of the Izaak Walton League of America, died March 28, 1950. Born in St. Cloud, Minn., he was graduated from the University of Minnesota, and practiced medicine in Watkins, Minn., for six years before coming to Minneapolis in 1926.

* * *

Dr. Burton J. Branton, 66, mayor of Willmar, died on May 9th. Dr. Branton founded the Willmar hospital in 1907, served as coroner for 12 years.

* * *

Dr. Nels Westby, Madison physician, died April 22. He served terms as mayor of Madison and had been a member of the schoolboard since 1927.

* * *

Dr. W. F. Baillie, who had practiced medicine in North Dakota nearly a half century and in Fargo 27 years, died May 5th. He was 72. He had been a general practitioner at Hunter, North Dakota, almost twenty years before coming to Fargo in 1923.

Dr. Neve, physician and surgeon at Rolette, North Dakota, died April 22nd at the age of 47. Dr. Neve practiced medicine in the cities of Bismarck, Hope, Minot and San Haven, coming to Rolette in 1944.

* * *

Dr. John H. Bond, 39, of Fargo died in his sleep April 28, 1950. A member of the Dakota clinic, Dr. Bond had practiced in Fargo since 1940.

* * *

Dr. R. C. Adams, a practicing physician and surgeon in Bird Island for 43 years, died April 25. He began his practice in Bird Island in 1907.

* * *

Dr. Pierre J. Fisher, a practicing physician at Marion, Indiana, died March 10, 1950. He had been ill for several months.

* * *

Dr. William K. Foster, 801 E. River Road, long associated with athletics in Minneapolis, died of a heart attack February 25th. He was 71. He was medical examiner for Minneapolis high school athletics for twelve years and served as a member of the University of Minnesota athletic department for sixteen years.

* * *

Dr. Charles L. Scofield, 85, Benson, Minnesota, one of Minnesota's pioneer physicians, died April 23rd. He practiced medicine in Benson for 57 years.

* * *

Dr. Charles F. Heinze, 78, of St. Paul, died April 23rd. A graduate of Central high school and the University of Minnesota medical school, he retired in 1932 because of ill health.

* * *

Dr. Frederick H. Rollins, 82, St. Charles, Minn., former Winona county state senator, physician and sportsman, died April 27th at Rochester, Minn. Dr. Rollins started practicing in St. Charles in 1898.

* * *

Dr. A. W. Shaw, 79, one of the founders of the village of Buhl, Minnesota, died April 16th. Among his many contributions to the community of Buhl was a hospital he built and operated.

* * *

Dr. William Stanford Emmerson, lately a resident of Waconia, died April 19th at the age of 72. Dr. Emmerson practiced his profession at Mayer for many years, but the last years was a resident of Waconia.

* * *

Dr. Justus Matthews, Minneapolis eye, ear, nose and throat specialist, died at St. Mary's hospital, Rochester, Minnesota, on May 21. The 72-year-old physician was a veteran of the Spanish-American War, a graduate of the University of Minnesota, and one time staff member of the Mayo clinic.

* * *

Dr. Horatio B. Sweetser, Sr., 88, one of Minneapolis' first practicing surgeons and a charter member of the staff of St. Mary's hospital, died May 23. He retired in 1933 after nearly 50 years of active practice.

Classified Advertisements

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A young general surgeon to work with a well established general practitioner. Modern, new hospital, western North Dakota. Write Box 897, The Journal-Lancet.

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FOR SALE

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The
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LANCET

JULY, 1950 Volume LXX, No. 7

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

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Publication Office, 514 Essex Building, 84 So. 10th St., Minneapolis 3, Minn.
Entered as second-class matter at the postoffice at Minneapolis under the act of March 3, 1879.
Published monthly. Single Copies 35c. One Year $3

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The JOURNAL LANCET

Minneapolis, Minnesota
July, 1950

Vol. LXX, No. 7
New Series

Coronary Artery Disease in Young Adults*

—*Etiology and Pathogenesis*

A. C. Grorud, M.D.†
Bismarck, North Dakota

The doctor and layman alike are prone to take a philosophical attitude when a serious coronary insult occurs in a patient of middle age or older. But when it strikes down a young adult, it is a catastrophic event, usually quite unexpected and often followed by difficult economic and sociologic sequelae. The fact that a constantly greater proportion of the population is living past the age of forty and accurate diagnostic methods have been developed, have combined to place coronary disease first in the causes of death. There is also the general impression that individuals under the age of forty are being more frequently afflicted with pathologic coronary arteries. The old saying is true, "A man is as young as his (coronary) arteries." Effective treatment and prevention of coronary artery disease are at present not possible, because the etiology and pathogenesis are still poorly understood.

The term "coronary artery disease" is used in this paper to include the syndromes of coronary occlusion, acute myocardial infarction, acute coronary insufficiency, and angina pectoris. Each has its own characteristic clinical and pathological features which are too well known to be discussed in detail at this time. Coronary occlusion occurs when a fresh thrombus is formed on the roughened intima of a coronary artery or when the lumen becomes obstructed by accumulated atheromatous material. Death may ensue either with or without the development of myocardial infarction. The rate at which the occluding substance is formed, plus the presence or absence of adequate collateral circulation, determines whether an infarct will occur. In cases of sudden death without demonstrable infarction, there may not have been time for this process to develop. Acute coronary insufficiency has been recognized during the past few years as a clinical syndrome midway between angina pectoris and acute myocardial infarction, but capable of causing death without absolute coronary artery occlusion and either with or without accompanying myocardial infarction. Nevertheless, coronary artery sclerosis is the basic, underlying pathology in all of these manifestations, and the symptomatology is the result of myocardial ischemia.

Thus, the quest for the etiology and pathogenesis of coronary artery disease resolves itself into the search for the causes and modes of development of arteriosclerosis. Although the terms have come to be used interchangeably, there is a distinction between arteriosclerosis and atherosclerosis. The former is considered a degenerative process accompanying aging, which makes for decreased arterial elasticity with replacement by fibrous tissue and calcium. Atherosclerosis implies the accumulation of cholesterol particles in the arterial intima, followed by the deposition of calcium. However, the two processes often co-exist, and one exaggerates the other.

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*Read at the North Dakota Regional Meeting of the American College of Physicians, Grand Forks, North Dakota, September 10, 1949.

†From the Department of Internal Medicine, Quain & Ramstad Clinic, Bismarck, North Dakota.

What are generally believed to be the most significant factors involved in the genesis of atherosclerosis, as they apply to coronary disease, will be briefly outlined.

Heading the list is the role of *cholesterol metabolism.* Hypercholesterolemia has been found in many patients with acute coronary occlusion by Morrison et al and others.[1] High serum cholesterol values and consequent atherosclerosis have been produced by feeding dogs high cholesterol diets.[2] However, the serum level is only a quantitative value of the lipid in the blood stream at a given moment, and does not necessarily reflect tissue cholesterol metabolism.[3] Furthermore, it has been shown that cholesterol in the body is largely endogenous in origin and capable of being synthesized from simple molecules, such as water and acetic acid.[4] Nevertheless, it is probable that derangement of cholesterol metabolism is significant in the development of atherosclerosis.

Heredity. It is commonly known that a family history of cardiovascular disease is usually present. But the relative importance of transmitted body build, biochemical functions, anatomical structure and physiological variations are not known.[5] However, Boas[6] and associates have presented evidence that an abnormal cholesterol metabolism is an inherited trait; and it is believed that selective atherosclerosis of coronary arteries follows an hereditary pattern.[7]

Hypertension. Approximately 50 per cent of all patients who have coronary heart disease have co-existing hypertension.[8] Apparently the stress and strain of elevated blood pressure on the coronary circulation accelerates or facilitates atherosclerosis. It becomes more evident in the older age groups.

Obesity. The general impression is that most coronary victims are either overnourished or possess exceptional muscular physiques. These types of body build together with an associated nervous temperament describes the personality of the typical coronary patient quite well. But there are many exceptions.

The endocrine panel: (a) *Steroid interrelationships.* The bile acids, the estrogens, the androgens, the adrenal cortical hormones, the cardiac glycosides, the 17-ketosteroids and cholesterol are all lipids and are all closely interrelated.[1] Endocrine implications concerning the pathogenesis of atherosclerosis could, therefore, be tremendous, provided cholesterol metabolism will unequivocally be proven the cardinal factor it seems to be at present.

(b) *Sex.* There is a striking preponderance of male over female patients. Under the age of forty the ratio is 24:1; in the forties, about 3:1; in the fifties, approximately 2:1; after sixty the ratio nears 1:1.[5] This suggests the presence of a protective, selective, gonadotropic hormone only as far as atherosclerosis is concerned; for we know that hypercholesterolemia is seen during pregnancy, and it is also a fact that gallstone formation, supposedly based on an imbalance between cholesterol and bile salts, is much more common in women. There is also a sexual anatomical difference in the relative thickness of the coronary intimas. Dock,[7] in a study of 24 infants who died at birth, discovered the male intimas to be three times as thick as in the female. Other factors being equal, this extra thickness would seemingly predispose males to the development of atherosclerosis from the start. Definite relief from angina was obtained by the use of sex hormones when Strong and Wallace[9] gave testosterone propionate to their male patients and estradiol dipropionate to females. They concluded that increased coronary flow resulted either from vasodilatation or prevention of vasospasm, mediated in some manner through both the endocrine and nervous systems. Other investigators have confirmed the value of this type of therapy, while still others[10] have obtained equivocal results.

(c) *Thyroid.* There is experimental evidence indicating that the administration of thyroid extract and iodides tend to retard atherosclerosis, while a state of hypothyroidism and thiouracil therapy induce the process.[11] These effects are related to cholesterol metabolism.

(d) *Diabetes and gout.* Statistics show that patients having either of these diseases are more likely to acquire coronary disease than others.

Tobacco. The ability of nicotine to cause vasoconstriction in peripheral arteries is common knowledge, and tobacco smoking is considered deleterious in peripheral vascular disease. The question of its power to constrict coronary arteries is controversial. Nicotine stimulates all ganglion cells, as well as the carotid and aortic sinuses. The S-T depressions on the cardiogram and the frequent reports of tobacco angina may be due to a transitory elevation of the blood pressure and increase of the heart rate — an epinephrine effect which increases the work of the heart. The consensus indicates that it causes an indirect unfavorable effect on coronary arteries that are already sclerotic, but a true etiological status is not likely. However, a vasotoxic nicotine effect has been cited as etiologically important in juvenile coronary sclerosis.[12]

Allergic Factors. The question of hypersensitivity to tobacco has been considered. Evidence shows it to be only a contributing factor and not an exciting one in most cases.[13] Histologically, it has been noted that at an early stage of coronary sclerosis, the vascular wall was filled with edematous fluid, fibrinoid swelling and active vascularization of all layers.[12] An allergic origin is, therefore, a possibility in at least some cases of coronary disease.

Psychosomatic panel. The personality of coronary patients is quite homogeneous and exhibits the following characteristic traits: industriousness, ambitiousness, outwardly calm appearance, but inward psychological instability and possessing a definite tendency toward smooth muscle tension.[14] In this connection we may speculate that frequently repeated coronary artery spasm, if it does occur, might institute the process of fibrosis and facilitate the laying down of cholesterol and calcium in the intimal layers of these arteries.

Occupation. Experience has shown no correlation between the incidence of coronary disease and either an active or a sedentary vocation.

Table I

Data on 32 Cases of Significant Coronary Disease in Individuals 40 Years of Age or Younger

Case No.	Sex	Age	Family History	Exercise During Youth	Occupation	Nutrition	Excessive Tobacco	Blood Pressure	Previous Angina	Electrocardiogram	Death	Autopsy
1.	F	32	○	Decreased	Typist	Under-D.&N.	+	Normal	○	Ant. Infarction	No	–
2.	M	40	+	Average	Farmer	Under-D.&N.	+	Hypotension	Atypical 2 yrs.	Ant. Infarction	No	–
3.	M	40	+	Average	Caretaker	W.D.&N.	○	Normal	○	Ant. Infarction	Yes	2*
4.	M	38	+	Average	Laborer	Very W.D.&N.	+	Normal	Typical 6 mos.	Post. Infarction	Yes	–
5.	M	36	+	Average	Cattle Buyer	W.D.&N.	+	Normal	○	Ant. Infarction	No	–
6.	M	36	+	Decreased	Minister	W.D.&N.	○	Normal	Atypical 2 years	Ant. Infarction	No.	–
7.	M	40	+	Decreased	Farmer	Obese	+	Hypertension	Typical 3 years	Myocardial Damage	Yes	4*
8.	M	40	○	Average	Executive	W.D.&N.	+	Normal	○	Ant. Infarction	No	–
9.	M	40	+	Decreased	Executive	W.D.&N.	+	Hypertension	○	Ant. Infarction	Yes	–
10.	M	23	+	Decreased	Soldier	W.D.&N.	+	Normal	○	Ant. Infarction	No	–
11.	F	34	+	Decreased	Housewife	Obese	○	Normal	Atypical 4 years	Post. Infarction	No.	–
12.	M	39	○	Decreased	Farmer	Obese	○	Normal	Typical 4 months	Post. Infarction	No	–
13.	M	40	○	Decreased	Lawyer	W.D.&N.	+	Normal	Atypical 1 year	Post. Infarction	No	–
14.	F	38	○	Decreased	Housewife	Obese	○	Hypertension	○	Ant. Infarction	Yes	2*
15.	F	27	○	Decreased	Housewife	Under-D.&N.	○	Normal	Typical 6 months	Ant. Infarction	No	–
16.	M	39	+	Average	Salesman	Obese	+	Hypertension	Typical 5 months	–	Yes	–
17.	M	34	+	Decreased	Farmer	W.D.&N.	○	Hypertension	○	Myocardial Damage	Yes	3*
18.	M	40	○	Decreased	Salesman	Obese	+	Normal	○	–	Yes	–
19.	M	34	+	Average	Laborer	Obese	○	Normal	○	–	Yes	1*
20.	M	40	+	Decreased	Mechanic	W.D.&N.	+	Normal	○	–	Yes	1*
21.	M	32	+	Increased	Farmer	W.D.&N.	+	Hypertension	Atypical 2 months	Ant. Infarction	No	–
22.	M	36	+	Increased	Farmer	W.D.&N.	+	Normal	Atypical 4 months	Post. Infarction	No	–
23.	M	40	+	Decreased	Garage Owner	Obese	+	Hypotension	Atypical 1 year	Post. Infarction	Yes	–
24.	M	31	+	Decreased	Theatre Manager	W.D.&N.	+	Hypertension	Atypical 1 year	–	Yes	1*
25.	F	36	+	Decreased	Housewife	Obese	○	Hypertension	○	Post. Infarction	No	–
26.	M	36	+	Decreased	Druggist	Obese	+	Hypotension	○	Myocardial Damage	Yes	1*
27.	M	40	○	Increased	Store Mngr.	W.D.&N.	+	Normal	○	Normal	Yes	3*
28.	M	40	○	Decreased	Salesman	W.D.&N.	+	Normal	Atypical 2 years	Normal	Yes	1*
29.	M	37	+	Decreased	Store Mngr.	Under-D.&N.	+	Normal	Typical 13 most.	Posterior Infarction	Yes	–
30.	M	37	○	Decreased	Salesman	W.D.&N.	+	Hypertension	Atypical 1 year	Normal	Yes	5*
31.	M	38	+	Decreased	Laborer	Very W.D.&N.	+	Hypotension	Atypical 8 months	Normal	Yes	4*
32.	M	28	+	Average	Laborer	W.D.&N.	+	Normal	○	–	Yes	2*

Chief Pathology (in addition to the marked coronary artery atherosclerosis present in all cases):

1*: Fresh thrombus in anterior branch of left coronary artery, without myocardial infarction (5 cases).
2*: Fresh thrombus in anterior branch of left coronary artery, with myocardial infarction (3 cases).
3*: Fresh thrombus in right coronary artery, without myocardial infarction (2 cases).
4*: No occlusion or infarction (2 cases).
5*: Anterior myocardial infarction without occlusion (1 case).

Several reports on the clinical course of coronary disease in young adults have been published in the past fifteen years[15,16,17,18,19 and others]. In summarizing the conclusions of these authors, the following points were emphasized: These patients tended to have a better than average muscular build and were somewhat overweight; typical angina symptoms did not precede the acute attack in most instances; the majority of authors stated that most coronary episodes followed strenuous physical exertion; selective sclerosis of the coronary arteries was the rule, since little evidence of generalized arteriosclerosis was found in these younger individuals. The unanimous, fundamental, pathological finding was the same as in older patients, namely, marked coronary atherosclerosis.

The most recent and most comprehensive survey of the problem has been given by Yater et al [20] in a study of 866 cases of coronary artery disease occurring in soldiers between the ages of 18 and 39 years.

PRESENT STUDY

The present study represents the 32 cases in the author's experience of coronary artery disease occurring in individuals forty years of age or younger, who sought medical aid because of this condition. They were seen over a ten year period, from 1939 to 1948 inclusive. This age group was selected for study of the factors in etiology and pathogenesis, from the clinical viewpoint, on the idea that certain elements might appear in sharper focus, since coronary artery disease in older people may summarily be ascribed to arteriosclerosis. The usual factors were investigated and another possible influence, the degree of physical activity in youth, was looked into in each case.

Exercise during that period of life between childhood and physical maturity was thought to be significant by analogy. It is during these years that the physique is developed, largely by muscular exercise, although heredity and nutrition are other factors. The cardiovascular system also develops during these years. We may assume that there is a certain reciprocal development of the cardiac muscle with the body musculature in response to physical exertion. In the absence of organic valvular and congenital defects, physiological cardiac hypertrophy is the only complication which might ensue. But what is more apropos to our subject, a corresponding coronary circulation is evolved, along functional if not structural lines, which is competent to supply the myocardium under conditions of unusual strain. In this respect, excessive muscular exertion during the socalled "formative" years would be desirable; the more strenuous, the better to endow one with a capable coronary circulation which might stand him in good stead in later years. The opportunity to obtain this exercise is universal, by means of the athletic programs in our high schools and colleges. In cases where this opportunity is not utilized, its equivalent might be realized by doing sustained manual labor. Competitive athletics in the more strenuous activities, such as swimming, water polo, basketball, track events and rowing should achieve the best results.

The question of "athletic heart" must be mentioned at this time. There is a difference of opinion on the subject of cardiac hypertrophy in response to physical exertion. Early work by Schumacher and Middleton[21] showed that athletic training leads first to physiological cardiac hypertrophy, but when prolonged by strenuous activity a variable degree of dilatation is added. They concluded that, generally speaking, an "athletic heart" is not desirable for ordinary activities. Wilce,[22] in a study of 233 athletes, concluded that the socalled "athletic heart" does not exist in the sense of a permanently enlarged, inferior heart, and that moderate variations in size should be considered normal. Dock[23] has shown that there is no evidence that even pathologically hypertrophied hearts have an inadequate vascular bed or their fibers are too thick for ample oxygen diffusion. Abrahams[24] suggested the possibility of two alternatives: either cardiac hypertrophy, comparable to muscular hypertrophy, does develop in response to violent exertion; or, some people naturally possess large hearts capable of sustained exercise.

The data for the 32 cases is given in Table I and a breakdown of this data is presented in Table II:

TABLE II

Total Number of Cases	32
Sex	Males, 27; Females, 5
Average Age	36
Family History of Cardiovascular Disease	Yes, 22; No, 10
Exercise During Youth	Decreased, 21; average, 8; increased, 3
Occupation	Sedentary, 17; active, 15
Nutrition	Well developed and nourished, 16; obese, 10; underdeveloped and nourished, 4; very well developed and nourished, 2
Excessive Use of Tobacco	Yes, 23; No, 9
Blood Pressure	Normal, 19; hypertension, 9; hypotension, 4
Previous Angina	None, 15; atypical, 11; typical, 6
Electrocardiogram	Anterior infarct, 11; posterior infarct, 8; myocardial damage, 3; normal, 4; none, 6
Total Deaths	19
Total Autopsies	13

In discussing this data it is seen that the ratio of males to females was about 5.5:1, which is much lower than expected for cases under forty years of age.

The family history of cardiovascular disease was considered positive if either hypertension or arteriosclerotic heart disease had been present in either or both parents. It was present in 22 cases (or 69 per cent), and is undoubtedly significant.

It was noted in this series of cases that 21 (or 65 per cent) had led a relatively sedentary youth, that is, they were less active physically than what would be considered within the range of average activity. This does not preclude the possibility that they may have been more active physically after the age of twenty-one. Various reasons were responsible, including these pathological conditions in individual cases: ankylosis of right knee following a septic arthritis; frequent disabling migraine; rheumatic fever; glomerular nephritis; congenital bilateral pes equinus; bilateral inguinal hernia (not repaired until the age of twenty); poliomyelitis with residual atrophy of the right leg muscles; diabetes mellitus. The associated obesity during youth in eight more of the cases was judged to be a significant factor in curtailing their participation either in competitive athletics or in sustained manual work. There was evidence that the remaining members in this category, including two cases of constitutional inadequacy, were psychologically not inclined toward undue exercise.

Eight patients (25 per cent) had neither a sedentary youth nor were they accustomed to expend unusual amounts of physical energy. These were classified as being average.

In only three instances (approximately 10 per cent) was there evidence of greater than average physical exercise in youth. Two of these were hard working farmers and the third was a store manager who had played basketball and baseball in high school and later on.

What is needed is a pathological study of the coronary arteries in a series composed of known athletes in order to properly evaluate the exercise in youth factor. However, the indirect inferences derived from the cases presented here suggest the importance of this increment in the etiology and pathogenesis of coronary artery disease. One can only speculate on the mechanism by which excessive exercise may exert a beneficial influence. Reasoning that sedentary youths (and probably normally active ones) do not develop a coronary reserve, the process of atherosclerosis, when present, will cause early symptoms. The corollary is, under the same conditions, that the presence of such a coronary reserve would act to postpone the appearance of coronary symptoms. In another way, we may wonder if the repeated coronary vasodilatation accompanying excessive exertion actually discourages the implantation of cholesterol and calcium in the coronary intima.

There was no correlation between coronary disease and active or sedentary occupations, there being about the same number of cases in each group.

As far as nutrition and body build were concerned, sixteen (or 50 per cent) were average, well-developed and nourished persons. Four were physically under par, and only two were hypersthenic. Ten (or 31 per cent) were obese. The obesity factor may have exerted its influence in three ways: by causing an extra load on the cardiovascular system; as a gross indication of a deranged lipid metabolism; and as a reason for non-participation in excessive exercise in youth.

The use of tobacco was rated as excessive when one package or more of cigarettes was smoked daily. Although this finding was positive in about 72 per cent of the total cases, its significance cannot be evaluated due to the widespread popularity of the tobacco habit.

In most of the cases the blood pressure remained within normal limits, and in four, readings of 100 systolic, or below, was the rule. The associated hypertension was probably significant in the nine instances (28 per cent) having a blood pressure consistently above 150/90.

Fifteen (or 47 per cent) had no angina pectoris preceding their coronary attacks. In eleven (or 34 per cent), the angina which was present for variable lengths of time, was atypical. This was not recognized in some and in others was attributed to associated conditions, including cholelithiasis, gastric hyperacidity and atypical pneumonia. In this connection, the use of an exercise tolerance test for coronary insufficiency like Master's "two-step",[25] or its modification as described by Katz and his associates,[26] is proving very valuable.

Electrocardiograms showed typical patterns for anterior myocardial infarction in eleven cases and posterior infarction in eight. No typical pattern was present in three cases, and these were termed "myocardial damage." Four cases revealed no abnormalities on routine cardiograms taken within a few months of their deaths. No cardiograms were obtained in six cases, all of which were sudden deaths, verified by necropsy and/or typical clinical pictures.

There were nineteen deaths in the series, giving a fatality rate of 59 per cent. In seventeen, death accompanied their first serious coronary insult. Only two patients had had a previous attack; cases No. 23 and No. 29 had each suffered an original posterior myocardial infarction within one year. These findings tend to support the theory of end-artery-like behavior of coronary vessels, without the presence of a collateral circulation in younger individuals.

Autopsies were done in thirteen cases (or 68 per cent), the chief findings of which have been summarized in Table I.

Summary and Conclusions

1. The recognized factors in the etiology and pathogenesis of atherosclerosis, as they apply to coronary artery disease, were reviewed.

2. Data on 32 cases of coronary artery disease in individuals forty years of age or younger were discussed from the clinical standpoint regarding the factors in their etiology and pathogenesis.

3. The concept of the beneficial effects of excessive exercise in youth is considered another significant factor in the etiology and pathogenesis of coronary artery disease. A coronary reserve is believed to be created thereby.

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RADIOACTIVE IODINE FOR THYROID DIAGNOSIS

Radioactive iodine offers new hope to victims of goiter and cancer of the thyroid as well as providing doctors a valuable diagnostic tool, according to Dr. Dwight E. Clark, who heads a clinical and research team in the program of applying the potentialities of the atom to peacetime uses at the University of Chicago. He said that in more than one-fifth of 60 cases of cancer of the thyroid treated at the university, radioiodine had shown some usefulness. In several cases other methods of treatment had failed, and little hope had been offered the patients. In these cases, the disease was at least temporarily arrested.

Radioiodine is useful because, like normal iodine, it becomes concentrated in the thyroid gland in the body. The radioiodine gives off beta rays which can destroy the surrounding cancerous tissue, even though the rays travel only a few hundredths of an inch. Radioiodine also gives off a small amount of the longer traveling gamma rays which allow doctors to trace the movements of the element through the body by means of Geiger counters. In some cases radioiodine has also attacked cancerous cells which have left the thyroid gland and localized in other parts of the body. These cells, because they originated in the thyroid gland, apparently retain the power to attract iodine in the blood. The rate at which radioiodine is picked up by the plasma in the blood gives doctors a clue to the health of the thyroid gland. When the rate is high, overactivity of the thyroid gland is suspected, even though other symptoms of goiter have not appeared.

The Role of X-Ray Therapy in Carcinoma of the Breast

Harvey W. Stone, M.D. and Halvor Vermund, M.D.*

Radiation therapy is today one of the major therapeutic agents available for treating breast cancer. The destructive effects of irradiation have been well demonstrated by numerous investigators. Engelstad[3] treated ninety-two cases preoperatively with epidermicide doses and found complete destruction of tumor in seventeen cases and strong irradiation effect in forty cases. Baclesse[1] treated fifty-eight cases preoperatively in which thirty-three cases showed changes varying from complete cell death to marked histopathological changes.

Radiation therapy is of obvious usefulness in those cases which present inoperable or recurrent tumor. These groups represent about 50 per cent of all cases of breast cancer seen at a large general hospital. At least 50 per cent of the remaining group treated surgically will require irradiation at some time during the course of the disease. In addition, if, as many feel, irradiation is of value as a pre- or post-operative measure, a very high proportion of cases of breast cancer will be treated at some time by this method.

What can radiation therapy accomplish in the treatment of breast cancer? To what extent should irradiation be employed in the management of this disease? Certain principles have been generally accepted. Thus, radiation therapy is the treatment of choice in inoperable and recurrent carcinoma of the breast. In this group there is evidence that palliative therapy is of definite value in increasing the length of survival as well as relieving symptoms. In the presence of bone metastases irradiation will achieve excellent pain relief and will usually be followed by evidence of bone regeneration. This becomes extremely important in lesions involving major weight-bearing areas such as the spine and the pelvis to obviate pathological fractures and their consequences. Hormone therapy, particularly estrogens, may be used in selected cases of wide-spread bone and soft tissue metastases with good results. In some cases, hormone therapy in combination with radiation to specific areas of involvement may be successfully utilized.

Recently a group of cases with pleural effusion due to metastases has been treated with irradiation to the chest wall to reduce the accumulation of fluid. Remarkable results have been obtained in a few cases with disappearance or marked reduction in the effusion. It seems justifiable to conclude that irradiation will be of palliative value in some patients with pleural effusion.

In some cases with inoperable breast cancer the tumor has been controlled by radiation therapy. In our series, four cases presenting themselves with inoperable cancer of the breast survived five years or more from the onset of x-ray therapy. In addition, local recurrences on the chest wall or in the axilla following previous treatment, and metastases to the supraclavicular lymph nodes have been controlled and occasionally eradicated by the use of x-ray therapy and/or implantation of radon seeds.

In operable carcinoma of the breast, however, there is a wide range of opinion concerning the role of radiation therapy. Most clinics feel that radiation therapy has little to add to the satisfactory results of surgery alone in stage I cases. Stage I includes cases with cancer confined to the breast and no microscopic evidence of regional lymph node metastases. In this group, surgery alone has given a five-year survival rate ranging between 70 and 80 per cent. Therefore, most patients in this category do not receive postoperative radiation therapy. However, evidence of local extension beyond the freely movable mass as indicated by superficial or deep fixation of the primary tumor probably affects the prognosis unfavorably. We feel that postoperative radiation therapy will improve the prognosis in these cases. Table I gives our results in fifty cases, most of which fall in this category. Twenty-eight out of forty cases or 70 per cent survived five years or more.

Table I
Survival of Patients in Group I

Year	Number of Cases	Number of Years				
		1	2	3	4	5
1939	10	10	10	7	7	6
1940	13	13	12	12	11	11
1941	12	11	10	10	8	8
1942	5	5	5	4	4	3
Total	40	40	40	40	40	40
Living		39	37	33	30	28
Percentage Living		98	92	82	75	70

The most important factor determining the prognosis of operable breast cancer is the presence or absence of axillary lymph node metastases. With the histological demonstration of axillary lymph node metastases the survival rate declines sharply. Thus, the results in stage II cases, in which axillary lymph node metastases have been found, will vary between 25 and 50 per cent five year survival.

There has recently been some discussion of the efficacy of radiation therapy applied as a pre- or post-operative adjuvant in stage II cases. Most authors have felt that the addition of radiation therapy increased the five-year survival rate. Although the increase was not great, the figures obtained from large series in which combined surgical and radiation therapy had been used were consistently better than those obtained by surgery alone. In this country less reliance on roentgen therapy has been noticed in the last few years. Pathological studies by Lenz[6] of malignant breast tissue removed after preoperative irradiation failed to show complete eradication of the cancer. Furthermore, Haagensen[4,5] found no statistical evidence that radiation therapy raised the rate of cure. These conclusions are in definite opposition to other investigations in which radiation therapy showed pronounced effect and, in many cases, was able to produce complete destruction of all malignant tissue in the operative specimens removed by subsequent radical mastectomy.

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Marked improvement of the results obtained by surgery alone has been accomplished through careful selection of patients and by restricting the criteria for operability. Haagensen[4,5] concluded that today enough has been learned about what can be accomplished with radical mastectomy to limit its use. By studying the correlations between the five-year survival rate and a series of clinical features of cancer of the breast, he discovered that there were eight types of cases that together formed a group in which surgery did not achieve a single cure. Cancer associated with pregnancy is included. Recent publications, however, indicate that these cases should not be included in the inoperable group. Engelstad[3] obtained 41.6 per cent five-year survival in twenty-four such cases. Thirteen of these were classified as stage I and II, and of these, ten survived five years or more. He concluded that the decisive factor in the poor results obtained by earlier investigators was the late institution of treatment; the chance for recovery in the early stages does not seem to be essentially different from that in non-pregnant women. In addition, Adair quotes Brooks' studies of pregnancy associated with breast cancer in which 38 per cent five-year survival was obtained. In Adair's material 25 per cent were alive at the end of five years. He feels that it is improper to classify the breast cancer-pregnancy cases as inoperable.

The role of radiation in stage II cases remains to be evaluated. The recent symposium on this problem given at the 30th annual meeting of the American Radium Society in Chicago indicated that radiation therapy as a pre- or post-operative measure is of value in the treatment of stage II breast cancer. Preoperative radiation is given in the hope of destroying the most malignant cancer cells which are most sensitive to irradiation; and therefore to reduce the possibilities of dissemination of tumor and the rate of local recurrence. Postoperative radiation therapy is given in an attempt to destroy the microscopic foci in lymph nodes and in the operative field.

It becomes obvious that even with the most meticulous surgery the tumor is often not completely extirpated in stage II cases. This is well brought out by Haagensen's own personal material in which 19 per cent developed local recurrence. The problem then becomes one of delivering a dose of radiation to the operative area which can destroy the remaining tumor.

Results obtained recently with radiation therapy are consistently better than those previously obtained by surgery alone, where there has been little selection of cases. Thus, Engelstad[3] reported 52.8 per cent of 494 patients in stage II who were symptom-free for five years or longer following radical mastectomy and postoperative radiation therapy. Berven[2] reported 43 per cent five-year survival in 354 stage II cases treated with pre- and postoperative irradiation. This latter investigator also made an interesting study of survival as related to the degree of axillary node involvement. There were 97 cases in stage II in which there were microscopically verified metastases to only one axillary node. Of these, 70 cases or 72 per cent survived five years or more, a survival rate equal to that of stage I. He also found definite evidence that preoperative roentgen treatment greatly improved the prognosis where the cancerous growth had broken through the capsule of the lymph nodes.

A tendency to increase the dose applied to the operative area and the regional lymph nodes has appeared in several of the recent publications. This may be one factor responsible for the increase in survival rate and the decrease in number of local recurrences.

In our material, 626 cases were referred for radiation therapy to the University of Minnesota Hospitals from January 1, 1939 to December 31, 1945. Three hundred and fourteen cases or 50.1 per cent were considered operable. Two-hundred and nine of these operable cases received treatment before the end of 1942 and could be included in the study of the five-year survival: 98 cases or 47 per cent survived five years or more from the beginning of x-ray therapy (table II). One-hundred-eighteen of the 209 operable cases were classified as stage II; 46 cases or 39 per cent of these survived five years or more (table III). It is interesting to note that of 78 cases in stage II treated by radical mastectomy at the University of Minnesota Hospitals and given radiation therapy at the same hospital a short time after the operation, 33 were alive at the end of five years, giving a five year survival rate of 42 per cent; whereas, of 40 cases operated upon outside the Hospital and referred for postoperative radiation therapy usually more than four weeks after the operation only 13 or 33 per cent survived five years or more.

TABLE II
Survival of Patients in Group II

Year	Number of Cases	Number of Years				
		1	2	3	4	5
1939	32	32	26	19	17	15
1940	29	25	20	17	14	13
1941	27	22	17	13	9	8
1942	30	30	21	17	15	10
Total	118	118	118	118	118	118
Living		109	84	66	55	46
Percentage Living		92	81	56	47	39

Local recurrence in the operative site occurred in 43 cases or 14.3 per cent. However, it is interesting to note that up to 1942 recurrence rate was 18.5 per cent (33 recurrences in 173 patients); whereas, since 1942 with the use of greater total x-ray dose the recurrence rate has fallen to 7.5 per cent (seven recurrences in 92 patients). It seems, therefore, apparent that local recurrence can be reduced by the use of irradiation.

Table III
Survival of All Operable Cases

Year	Number of Cases	Number of Years 1	2	3	4	5
1939	53	50	42	32	30	26
1940	54	49	41	37	32	30
1941	57	48	40	34	28	24
1942	45	43	34	27	25	18
Total	209	209	209	209	209	209
Living		190	157	130	115	98
Percentage Living		91	75	62	55	47

It must again be emphasized that the usual selection of patients suitable for radical mastectomy is not nearly as strict as in Haagensen's[4,5] series. Thus, in our own series there are patients included who had radical mastectomy though they were inoperable according to Haagensen's criteria. This must be kept in mind when the survival rate is considered.

Conclusions

We feel that from our own material and from recent publications in the literature the following conclusions can be drawn:

1. Stage I cases of carcinoma of the breast: Breakdown into two groups.
    (a) Those with a freely movable primary mass: the treatment of choice is radical mastectomy alone.
    (b) Those with evidence of extension beyond the primary mass, such as superficial or deep fixation; postoperative x-ray therapy should be used.
2. Stage II cases can be divided into two groups.
    (a) Those in which there is no clinical evidence of tumor extending beyond the capsule of the lymph nodes in the axilla: these should be treated by radical mastectomy and postoperative irradiation delivering a relatively large dose over a period of two to three weeks and given within two weeks after surgery.
    (b) Those in which there is clinical evidence of extension beyond the capsule of the axillary lymph nodes. These should be given preoperative radiation therapy followed by immediate surgery and postoperative irradiation.
3. Inoperable and recurrent cases should be given radiation therapy as the treatment of choice with the exception of a few cases in which hormone therapy can be successful applied.

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RESEARCH CAREERS IN HEART DISEASE

Acting to help meet the urgent need for qualified research workers who can concentrate their full time in the heart disease field, the American Heart Association is establishing Career Investigatorships as part of its research program. These investigatorships will be made available to "a select group of outstanding persons of unusual ability and originality," preferably in the 35 to 45 age group.

Nominations for Career Investigators may be made by members of the Scientific Council of the American Heart Association, deans of medical schools, and heads of research units in the United States. The nominations should be sent to Dr. Charles A. R. Connor, the Association's Medical Director. The investigator may work in any institution in the United States which offers adequate facilities, and he will be free from additional administrative duties at that institution. Not more than 15 per cent of his time is to be spent in teaching.

The Treatment of Congenital Clubfeet with Wedging Casts

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CONGENITAL clubfoot or congenital talipes equinovarus is one of the most common and most important of all congenital anomalies. It makes up 75 per cent of all congenital abnormalities of the foot and occurs about once in each 1000 births. It is more common in the South than in the North.[5] Males are affected about twice as frequently as females. Statistics from most clinics show that one foot is affected more frequently than are both.

ETIOLOGY

A hereditary factor is often concerned in the etiology. Reports reveal a hereditary background in from 5 to 22 per cent of patients with this deformity. Kite[4] observed that many parents were reluctant to admit the occurrence of the deformity in other members of the family, and in his first reported series of 100 cases, found a family history of the deformity in 45 per cent of patients.

The deformity probably results as an arrest or anomalous development of that part of the germ plasm which makes up the foot of the embryo. The work of Max Bohm,[1] published in 1929, supports this theory. Indirect support of this view is also afforded from the statistical fact that from four to twelve per cent of patients with congenital clubfoot have other congenital anomalies as well.

Another theory considers the deformity as a failure in rotation of the hind limb. The foot normally occupies an equinovarus position at the third month of gestation. As the fetus develops, inward rotation of the limb takes place with the adult position being attained by the seventh month. If inward rotation fails to occur, the foot remains in an equinovarus position and the child is born with a clubfoot.

PATHOLOGY

All degrees of deformity may exist from mild to severe in which the toes may actually touch the inner border of the leg. The Achilles tendon is shortened, and the anterior and posterior tibials are contracted. The talus is frequently wedge-shaped and is plantar flexed so that only its posterior superior surface is in contact with the tibia. The os calcis is tilted downward, and its anterior end is rolled inward under the head of the talus producing inversion of the heel. The navicular is rotated from its normal position to lie medial to the head of the talus. The distal ends of the tibia and fibula are rotated inwardly producing "tibial torsion." In cases of long standing where weight has been borne on the deformed foot, a bursa may be present on the lateral border of the dorsum of the foot.

CLINICAL PICTURE

There are four deformities present in a congenital clubfoot.

1. *Adduction of the forefoot:* The anterior half of the foot is adducted. Thus the lateral border is convex and the inner border is concave. A transverse crease crosses the middle of the sole.

2. *Inversion of the hind foot:* The heel is inverted in a position of varus. The inversion does not occur at the ankle joint, which is held firmly in the ankle mortise, but rather in the subtalar joint between the talus and the os calcis.

3. *Equinus:* The heel is drawn up and the foot is plantar flexed. The equinus deformity consists of two parts: the forefoot is plantar flexed when compared with the hind foot producing "forefoot equinus," and the hind foot is plantar flexed at the ankle joint producing "ankle equinus."

4. *Tibial torsion:* A varying amount of inward rotation of the distal tibia and fibula occurs accentuating the deformity. This can best be determined by holding the extended leg with the patella straight up and observing the malleoli. In the normal foot the lateral malleolus will be found to lie slightly posterior to the medial malleolus. In the clubfoot this relationship may be reversed.

X-RAY

The value of the x-ray in the diagnosis and treatment of clubfoot lies in determining the amount of inversion present in the hind foot. An anteroposterior film of the foot will demonstrate this. Normally the shadows of the os calcis and the head and neck of the talus are separated. In an untreated or insufficiently treated clubfoot the two shadows will be found to be superimposed.

Kite[2] has pointed out that clinically a foot may appear fully corrected but may return rapidly to the deformed position once casts are discontinued. X-rays of these patients reveal that the normal relationship between the os calcis and talus had never been obtained.

PROGNOSIS

Ninety per cent of patients with clubfeet who are properly treated within the first six months of life can obtain complete correction and essentially normal feet by non-operative means. Ten to fifteen per cent of the cases, according to Kite,[3] tend to relapse and require a second period of treatment. About ten per cent of the patients will require some operative procedure.

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Treatment

The non-operative treatment of congenital clubfeet should begin during the first month or two of life. A good result still may be expected, however, if treatment is delayed up to the age of six months. All patients, regardless of age, should be treated with wedging casts previous to any contemplated surgery. Considerable correction can be obtained by this method even in mature feet, thus minimizing the extent of the operative procedure.

Treatment is carried out by the application of padded plaster casts which are wedged at weekly intervals. Each cast can be wedged about two times after which it is removed and a new one applied. The treatment can be divided into four phases: (1) correction of the forefoot adduction and hind foot inversion, (2) correction of the equinus deformity, (3) retention in an over-corrected position and (4) follow-up treatment.

The foot is held by the physician treating the case, and the cast is applied by an assistant. The roles played by the two are important and should not be reversed. Application of the cast is a simple procedure easily learned by a capable assistant. Learning to hold the foot in the proper position, though apparently a simple task, is one which requires considerably more practice and experience.

1. *Correction of the forefoot adduction and hind foot inversion:*

The physician stands on the side of the lesion and if the right foot is involved grasps the forefoot with his right index finger and thumb. The former lies along the plantar surface of the great toe with the ball of the finger just distal to the metatarsal head. The thumb lies along the dorsum of the toe. The left hand supports the leg grasping it at the knee. With the foot in equinus and the forefoot abducted, a cast is applied extending from the ends of the toes to below the knee. As the turns of plaster are applied to the foot, the finger and thumb can be lifted so that a smooth fitting cast results. The foot is held in the corrected position until the plaster is hard. As succeeding casts are applied, the inversion of the heel is gradually corrected. Usually this will be found to be entirely corrected by the time over-correction of the forefoot has been obtained.

The following week a wedge is removed from the cast (figure 1). The base of the wedge is lateral over the cuboid, and the apices lie just lateral to the anterior tibial tendon dorsally and at a similar point straight through the foot on the sole. A single transverse cut is then made medially with the saw leaving a dorsal and a plantar bridge of plaster approximately one cm. in width to function as a hinge. The forefoot is then pushed further into abduction, and a plaster bandage is applied to stabilize the cast.

When the forefoot deformity has been well over-corrected and the unsupported foot no longer hangs in a position of forefoot varus, an anteroposterior x-ray should be made to determine whether or not the inversion element has been completely corrected. To proceed with correction of the equinus before the os calcis and talus lie in normal relationship to each other is to court early recurrence of the deformity.

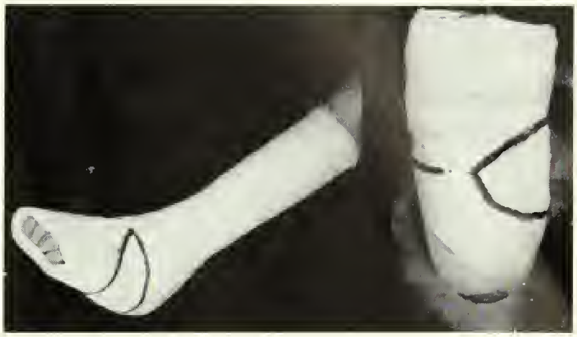

Fig. 1. The cast is marked for wedging to correct forefoot adduction. The base of the wedge lies over the cuboid and the apices lateral to the anterior tibial tendon and straight through on the sole. A transverse cut is made medially leaving dorsal and plantar "hinges".

2. *Correction of the equinus deformity:*

When the preceding deformities are completely corrected, wedging in dorsiflexion is carried out to correct the equinus element. A cast is applied as before but should extend this time above the knee with the knee flexed at a right angle. By extending the cast above the flexed knee the heel is prevented from separating from the sole of the cast as the foot is brought up into dorsiflexion.

In holding the foot while plaster is applied, the same procedure as described previously is followed. However, after the cast is on and before it has hardened, pressure is made upward with the thumb over the plantar surface of the os calcis. By applying pressure in this region rather than against the forefoot, dorsiflexion occurs at the ankle rather than at the mid tarsus which would produce a "rocker-bottom" type of foot.

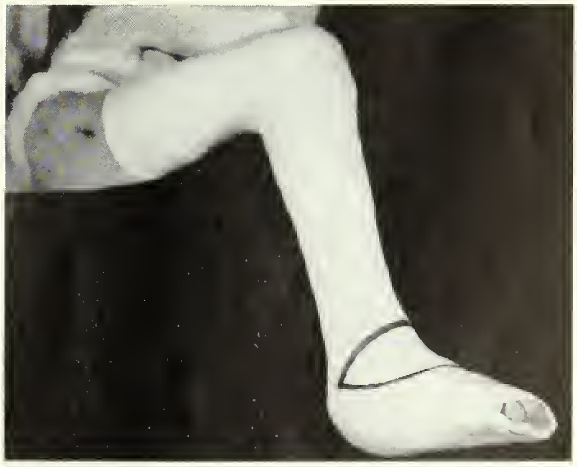

Fig. 2. When the foot is ready to be wedged into dorsiflexion, the cast is extended above the flexed knee. The base of the wedge now lies over the dorsum of the foot and ankle with the apices slightly posterior to the lower borders of the malleoli.

A week later a wedge is removed from the cast with its base over the dorsum of the foot and the apices posterior to the lower borders of the inner and outer malleoli (figure 2). A bridge of plaster approximately two centimeters in width is left posteriorly over the heel cord to function as a hinge. The foot is then dorsiflexed, and a plaster bandage is applied over the foot and ankle of the cast.

It should be mentioned that in wedging to correct both the forefoot deformity and the equinus element, the edges of the wedged cast should be turned out to prevent pressure. By this simple measure pressure sores can almost entirely be prevented.

3. *Retention in the over-corrected position:*

When the foot easily can be brought up well past a right angle at the ankle, a retaining cast is applied. This usually extends only to the knee and is changed at three to four week intervals. The foot is retained in the over-corrected position for from eight to twelve weeks depending on the severity of the original deformity.

4. *Follow-up treatment:*

After the casts are removed a clubfoot type of shoe is applied, and the child is encouraged to stand and walk. The mother is instructed in stretching exercises to be carried out several times daily in which the forefoot is stretched into abduction and the hindfoot into dorsiflexion. The shoes are worn both night and day for the first six months, being removed daily for washing and powdering of the feet.

The child is followed in the outpatient clinic at monthly intervals for several months, and when it is certain that the mother understands the follow-up care and does the stretching exercises well, the interval can be increased to three or four months.

If there is evidence that a foot has relapsed it is put in plaster again immediately, and further wedging followed by a period of retention is carried out.

SUMMARY

Most children with a congenital clubfoot deformity treated within the first six months of life can obtain a functionally normal foot by non-operative treatment. Plaster casts are applied and wedged to correct the deformity, the forefoot adduction and inversion of the heel being corrected first and the equinus element last. The feet are then held in retention casts for a period of eight to twelve weeks. Following removal of the casts follow-up treatment consisting of stretching exercises and clubfoot shoes is necessary. If the deformity recurs, it is immediately treated by a second series of casts and wedging.

This method should be thoroughly applied before operative measures are undertaken.

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NEW TREATMENT FOR RADIATION VICTIMS

Blood transfusions combined with the antibiotic drug aureomycin provide the best presently known method of treating victims of excess radiation, according to a University of Chicago research team headed by Dr. J. Garrott Allen, associate professor of surgery. For the first time, this treatment has permitted dogs to survive otherwise deadly doses of radiation in the laboratory. Two out of ten animals survived the critical six-week period following exposure that ordinarily would result in death.

Dogs were used as the experimental animals because their reactions to radiation closely resemble those observed in human victims of Hiroshima and Nagasaki. Neither blood transfusions nor aueromycin alone allowed the dogs to escape death, although aureomycin allowed them to survive longer. Combined, however, they were effective. The transfusions, given every second day, helped replenish the animal's depleted blood supply and warded off anemia. The aureomycin controlled the infection which often causes radiation exposure to end fatally.

The University of Chicago investigators stressed that radiation damage affects the entire system of the victim. Merely local treatment of wounds and burns will not help unless the radiation effects on the entire body are taken into account.

Recent Poliomyelitis Experience in Minnesota

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In the five-year period 1945-1949, there have been roughly five times as many cases of poliomyelitis reported in Minnesota as in any preceding five-year period, and two to four times as many deaths. From approximately 1,200 cases in each five-year period prior to 1945, the number reported rose to 6,400 in the years 1945-49, and deaths increased from around 175 to 475. Why has there been this marked change and what have been the results of this altered behavior in a disease that causes such great anxiety?

It has been aptly said that every poliomyelitis epidemic comprises actually two diseases, poliomyelitis and hysteria; the latter has in the past been of great concern. Yet, the experience of the last few years leaves no doubt that the number of individuals actively attacked by the organic illness has been greatly increased as well, so that the problems posed by the epidemics have been doubly compounded.

What is an epidemic of poliomyelitis? This question is raised each year by newspaper reporters especially, who are eager to announce to their readers the exact day when the summer's experience moves from the outbreak stage into the epidemic category. This is an arbitrary use of terms, and especially so in a popular sense, distasteful because of its connotation of hysteria and panic. From a more scientific viewpoint, however, statistical definitions of epidemics may be helpful. Even here the necessary information about an outbreak is not available until the year is completed so that the term epidemic in a statistical sense is of historical rather than news value.

An epidemic is generally regarded as an unusual and temporary increase in the prevalence of a particular disease in a specified population. A generally accepted standard of "unusualness" for this definition would be those increases in poliomyelitis prevalence that represented the top five per cent of the total 100 per cent of all recorded increases. Such calculations have been worked out in detail upon the recorded rates of poliomyelitis in all the counties in the United States over a 15-year period, 1932-1946, and described in a recent article.[1] On the basis, then, of actual recorded experience in the United States in recent years, an epidemic of poliomyelitis in Minnesota can be considered as an annual rate of 35 or more cases per 100,000 population. This would require 1,015 cases in a year if Minnesota's population be assumed as 2,900,000.

By this definition, there have been three epidemics in the last five years and only two in the entire remainder of the period 1915-1944. In 1916 the rate reached 40.3 and in 1925, 38.6. But in 1946 Minnesota's rate of reported poliomyelitis cases was 102.3; in 1948, 47.2; and in 1949, 57.6. (See Table I.)

The epidemic of 1949 came as an unpleasant surprise and before the end of the year had counted more cases than in any previous year except 1946. Following the 1946 outbreak it was hoped that Minnesota would escape major poliomyelitis attacks for a number of years but the respite extended only through 1947. 1948 again was an epidemic year and 1949 exceeded 1948. A total of 1,716 cases were reported in 1949 in Minnesota residents with 108 deaths, and an additional 178 cases and 14 deaths in non-residents. This rapid succession of epidemics has been unprecedented in Minnesota and disconcerting.

A study of the geographical distribution of reported cases in recent years lends some support to the accepted belief that immunity is acquired by infection, even if infection is clinically inapparent. Spot maps by month of onset reveal clearly that the state-wide total of cases is made up of numerous local epidemics which flare up and die down, mainly influenced by the available numbers of susceptible individuals. It seems necessary that these susceptibles live in fairly close proximity if an epidemic is to occur. If enough of these local epidemics occur in population centers of sufficient magnitude, then the year's state total rises to epidemic proportions as defined above. In 1946, Minneapolis was the major focus of such a local epidemic. Its large population contributed to the record breaking total of cases for that year. Numerous other parts of the state had local epidemics in 1946 also, especially in the northern counties.

In 1948, the earliest and most intense local outbreaks were in the southern counties, with later epidemics in the southwest corner of the state, and in the west central counties. Minneapolis and St. Paul were largely spared, as was the northern half of the state. A fairly consistent pattern of immunity remaining from 1946 infections seemed to be revealed.

In 1949, however, local epidemics again developed in the metropolitan area, although not actually within Minneapolis; in the southern counties; and now again in the northern portion of the state. Cases seemed to be distributed much more uniformly throughout the state than in 1948; 83 out of the 87 counties reported cases. It appeared that any immunity remaining from 1946 and 1948 had decreased to a point which permitted another epidemic.

In two respects, the 1949 outbreak showed no appreciable difference from previous epidemics. This related to season and sex distribution. The onset of the disease appeared in June as usual, increasing in numbers through July, to a peak in August, then subsiding more slowly throughout September, October and November. This seasonal pattern has been fixed so definitely in Minnesota that with the approach of summer vacation days in recent years, parents almost unconsciously begin to worry about poliomyelitis.

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That the disease is not restricted to hot weather, however, is shown by a recently reported epidemic which occurred in midwinter among the Eskimos of Arctic Canada.[2] Some 75 cases and 16 deaths resulted from poliomyelitis which occurred in two local epidemics beginning in October and extending through February into March. The population group attacked was a settlement of Eskimos living on the northwest coast of Hudson's Bay, in a frozen wilderness 150 miles north of Churchill. The average temperature was 27 degrees below zero, Fahrenheit, during January, February and March. In this instance there was no relation between the development of cases and association with flies, fresh fruits, or vegetables, or bathing beaches. There have been other reported epidemics of poliomyelitis not conforming to the Minnesota pattern of hot summer months.

The other feature of Minnesota's 1949 epidemic which was unchanged was the distribution of cases among the two sexes. For some reason, approximately 55 per cent of all reported cases occur in males, and 45 per cent in females. The figures for 1949 were 55 per cent males and 45 per cent females. This distribution is noted throughout the United States year after year.

There is, likewise, a strikingly uniform distribution of deaths among the cases according to the two sexes, and this pattern is much the same each year. Thus, roughly 65 per cent of all the deaths from poliomyelitis occur in males, and 35 per cent in females. This was true in 1946, 1948 and 1949.

This sex distribution is further clarified by a study of the occurrence of cases and deaths by age groups. Such a study shows that males of the age group, 1–20 years, consistently contribute many more cases and deaths than do females of those ages. This preponderance of young males accounts for the over-all characteristic distribution mentioned earlier, of more males than females. After age 20 years, however, there is no particular difference

TABLE I

POLIOMYELITIS IN MINNESOTA

By Month of Onset — 1910 - 1949, inclusive

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Cases	Deaths
1910	23	8	9	5	8	19	45	140	117	85	17	5	481	201
1911	4	6	6	5	9	14	31	18	9	7	4	2	115	58
1912	2	2	5	3	1	0	4	4	3	4	5	2	35	23
1913	4	2	2	4	0	4	13	39	10	4	2	1	85	30
1914	6	1	1	3	1	1	2	1	1	3	2	0	22	8
1915	3	1	2	1	0	2	0	28	38	27	17	3	122	26
1916	2	3	1	0	9	16	224	343	197	95	17	5	912	105
1917	0	6	5	6	4	7	11	14	12	6	1	3	75	10
1918	1	2	0	3	2	8	12	38	13	3	1	0	83	22
1919	2	1	1	1	3	1	22	24	17	9	3	1	85	16
1920	2	1	1	0	3	1	5	20	18	11	10	2	74	18
1921	2	0	3	8	13	68	192	222	126	54	8	6	702	102
1922	1	0	2	2	0	6	3	15	6	13	1	2	51	20
1923	1	0	0	0	3	6	9	21	17	13	4	6	80	17
1924	1	0	3	0	2	2	4	30	29	39	22	4	136	31
1925	1	1	5	2	2	28	181	332	290	90	20	3	955	145
1926	4	0	3	2	1	3	8	8	9	5	1	2	46	15
1927	4	2	1	2	2	2	14	15	50	30	14	3	139	36
1928	0	2	4	2	3	5	11	47	94	34	20	2	224	57
1929	3	0	0	1	1	1	6	5	8	5	1	1	32	6
1930	1	2	2	7	12	19	63	106	101	112	40	14	479	37
1931	7	7	2	1	6	7	31	168	278	213	74	17	811	66
1932	6	0	3	0	0	9	16	37	34	13	4	2	124	10
1933	1	2	0	1	5	5	38	110	130	77	13	1	383	37
1934	4	1	1	1	1	2	11	26	27	27	9	3	113	21
1935	8	1	5	4	5	3	4	29	24	8	6	2	99	10
1936	1	0	1	0	1	1	5	4	13	6	4	1	37	4
1937	3	1	0	1	1	1	13	65	172	72	18	7	354	50
1938	4	1	0	0	1	0	5	15	13	3	1	1	44	10
1939	1	2	0	0	1	2	25	205	198	97	24	9	564	53
1940	7	2	1	4	1	2	3	34	82	84	28	4	252	26
1941	1	1	2	2	3	9	20	89	94	43	23	5	292	33
1942	1	1	1	1	4	2	6	22	22	9	8	3	80	6
1943	2	1	0	1	0	2	15	46	67	24	1	0	159	10
1944	1	0	1	0	4	10	44	197	163	86	20	4	530	37
1945	2	1	1	2	1	4	4	53	88	54	18	5	233	25
1946	1	1	0	2	8	36	791	1219	558	191	60	14	2881	226
1947	6	5	3	1	4	7	25	70	42	15	16	7	201	13
1948	2	4	3	6	8	4	120	332	438	283	141	46	1387	110
1949	18	18	6	1	7	59	322	664	424	143	43	11	1716	108

in occurrence of cases in the two sexes. This type of data has led to suggestions that physical exhaustion may be important in the development and the outcome of cases of poliomyelitis, on the theory that male children engage in more exhaustive physical activity than do girl children. While this has been borne out clinically in some cases, there is danger in jumping too quickly to such conclusions.

Further examination of the age distribution of cases and deaths in the three recent Minnesota epidemics does not reveal any marked alteration from one outbreak to the next. Roughly, 45 per cent of all cases in recent outbreaks are in persons between 5 and 15 years old; 25 per cent of cases in children under five years, and 30 per cent of cases fall in persons 15 years and older. Approximately 50 per cent of all deaths occur in individuals 15 years and older; 30 to 40 per cent of the deaths in the 5 to 14 year group; and 10 to 20 per cent deaths in the under 5 years group. In general it may be said that poliomyelitis affects younger people predominantly, with a fatality rate rising steadily with age. The older the patient, the more chance he has of dying from his infection.

Although each epidemic differs slightly from the others in rates and percentages of cases and deaths among the various age groups, there seems to be no consistent trend which can be seen and interpreted as a result of the preceding year's experience. This is understandable if it is remembered that the total state-wide experience each year is the summation of numerous local epidemics, shifting in location annually. The population groups involved seldom are the same from one year to the next.

The outcome of the three epidemics, likewise, varied in some respects. In regard to the fatality rate, however, there was little difference. In 1946, 7.8 per cent of all cases died; in 1948, 7.9 per cent; and in 1949, 6.2 per cent. This is reflected too in the percentages reported each year of bulbar cases, since this type supplies the fatalities. In 1946, 17 per cent of cases were bulbar; in 1948, 20 per cent, and in 1949, 18 per cent. The figures assembled each year of the number of cases reported as paralytic exclusive of bulbar, and of non-paralytic cases, differ rather widely in different years, reflecting to some extent variable standards of diagnosis of what constitutes paralysis. The duration of paralysis, likewise, confuses the classification of cases for reporting purposes.

There is little from the data mentioned above that helps to answer the question as to why poliomyelitis seems to be so much more of a problem in recent years. Perhaps the problem, always present, has been given so much more attention and emphasis that it now occupies a dominant position as compared to formerly. Recent studies of a more complex nature show, moreover, how much more must be learned about the disease before the question can be answered. For instance, it has been known for some time that for every recognized and reported case of apparent infection, there are from 10 to 1,000 or more inapparent, or unrecognized infections, with the same virus, in the same area and time. Likewise, more effective laboratory studies are revealing that the clinical picture of symptoms called poliomyelitis may be caused by different viruses, not all of the same virulent or fatal nature. As these studies of the infecting agent continue, as better diagnostic methods are devised, and as immunizing procedures are developed, the picture of the incidence of poliomyelitis may be expected to alter, and the answers to many questions made clear.

Along with technical advances mentioned above, there have been developing many new activities in related fields of community life, public health, hospital administration, and in many other areas. The prevalence of poliomyelitis in recent years has produced certain definite results in the methods of countering such epidemics. Everyone is aware of the changing technics for caring for the individual patient which have resulted from the intensified emphasis devoted to the disease. But many similar sweeping changes have occurred in other fields also.

A very valuable clarification of knowledge about the disease has been made as a result of national conferences as a way to answer practically all problems related to the control of poliomyelitis. This guide is used by health officers, hospitals, physicians and others. It has been publicized and adopted uniformly in every state of the country and, as a result, many practices which formerly were ineffective in controlling poliomyelitis, as well as being unwarranted by facts, and which created problems for patients and families, hospitals and doctors, have been changed.

These changes usually have been to shorten the isolation period required of reported cases, and to free contacts of unnecessary restrictions. This helps to make more space available in hospitals for essential isolation cases, and reduces needless economic and social hardships for patients and families. More liberal interpretation of scientific facts has reduced barriers to more effective treatment, and at the same time reduced financial burdens to hospitals, patients, and agencies paying for care. All these matters are important in poliomyelitis; at the same time no adverse results have been traced to newer procedures.

Among recommended practices now widely accepted is the growing trend to admit poliomyelitis patients to general hospitals provided that appropriate isolation precautions are employed. These isolation technics have been specifically described as well as the factors indicating the need for special nursing. As a result local means are better able to meet the recurring demands of frequent epidemics.

The factors bearing on the normal pattern of life in the community have, likewise, been discussed and defined. Thus specific recommendations are now accepted in regard to the closing of schools, public, boarding, and nursery; the functioning of summer camps; and the operation of places of recreation and amusement. These problems in the past have been met with widely differing solutions, and confusion and uncertainty have aided the panic associated with an epidemic. Now effort is concentrated on maintaining the usual routine of the community as much as possible as an effective counter pressure to hysteria.

One of the most important developments which has come about as a result of the increased prominence of poliomyelitis as a threat to the community is the coordination of planning to combat the disease. In a majority of states, poliomyelitis planning committees have been organized to develop a state-wide plan for insuring good and complete care for children and adults. These committees bring together representatives of cooperating professional groups and individuals, hospitals and other facilities that provide care, and official and voluntary agencies responsible for various parts of the program of making care available to those who need it.

A suggested guide for use of these committees has been prepared and widely circulated. This guide suggests the composition of the committee, its method of functioning and the types of problems which might be considered and solved. These include, for example, activities in health education; hospital and convalescent care; personnel; braces and appliances; diagnostic and consultation services; and after-care. Such a program encompasses practically all the problems that are associated with poliomyelitis epidemics. By early planning and agreement, many of these problems can be more easily solved, and better use is made of what facilities already exist within the state.

In conclusion, then, it can be seen that the last five years have witnessed an unusual prevalence of poliomyelitis in Minnesota with no good explanation or reason. This disease has not seemed to behave in any unusual fashion other than its prevalence, and each epidemic resembles closely the others. There has been, however, a great development in community awareness of, and organization for methods of combating the disease, in the sense of providing facilities for diagnosis and treatment. Additional measures to be taken include intensified laboratory study of the causative virus and the development of an immunizing procedure.

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WELL PLAYED, DOCTOR!

The Annual Cricket Match, between Birmingham Doctors and Clergy, was played on the Warwickshire County Cricket Ground (by kind permission of the W.C.C.C.) on Saturday, September 3rd.

Beautiful weather favoured the occasion and the wives, families and friends of the team took advantage of the opportunity to have a very pleasant day in happy surroundings.

Lunch and tea, provided on the ground, added to the enjoyment, not altogether excluding the fact that it relieved, for the day, the necessity of supplying these meals at home!

The Lord Mayor, who intended to be present, was prevented by an urgent last minute engagement from fulfilling his promise.

The game itself provided a keen contest and it was not until within the last few minutes that the doctors claimed victory.

The reward for victory is the privilege of holding for twelve months a handsome silver casket containing the ashes of one of the cricket bats used in the first match of its kind in 1928.

The casket—known as the "Thwaite Trophy"—was presented by Dr. Harold Thwaite, and the ashes by Dr. Haslam.

The proceeds from the match amounted to £94, and this amount was divided equally between the Clergy Aid Society and the Royal Medical Benevolent Fund.

The Committee wish to express their deep appreciation of the assistance rendered by Mr. Deakins, Secretary of the County Cricket Club, Miss Branson, Hon. Secretary of the Match Committee, the Warwickshire County Cricket Club for the use of the ground, and all others who helped to ensure the success of the function.

Doctors and Clergy Cricket Match. Birmingham Medical Review 16:174, 1949.

Ophthalmic Headache

A Differential Study

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Headache is a symptom of many ailments and on many occasions can be categorically defined. It will be attempted subsequently to establish the origin of some of the ambulatory headaches, more particularly those relating to the eyes. The family physician, the internist, and the pediatrician often see these headaches first and wish to rule out those of ocular origin. This is right and will be justified subsequently.

In his monumental treatise, *Headache and other Head Pain,* Wolff states: " . . . and though there are few instances in human experience where so much head pain may mean so little in terms of tissue injury, failure to separate the ominous from the trivial may cost life or create paralyzing fear."

Patients with headaches are seen complaining, or concerned about three things. First, they are disturbed because their headache inconveniences their feeling of well-being, and interferes with their job or with their pleasures. Second, they are worried about a brain tumor. To reassure all headaches of known origin that they do not have a brain tumor is sound counsel and often does much to relieve their anxiety which in turn further relieves the headache. Many times these people are worried about a brain tumor but will not mention it. John Gunther's *Death Be Not Proud* (his seventeen year old son died of a brain tumor) and the newspaper articles, pushing the cancer fund, do a lot to set up anxieties in this direction. Thirdly, patients with "terrible headaches" periodic, incapacitating, prostrating cephalalgia who are seeking relief of any sort.

Localization

The location of the headache may or may not be significant. In sinus infections it is usually in or about the face, occasionally deep to the eyes, and can be assigned to adjacent disease. Elsewhere the location of the pain and the site of the inciting pathology are not related. A time profile of the headache is of considerable clinical significance, much more so than location. A knowledge of time and character of onset, duration, period of greatest intensity, interval between headaches and associated or allied disturbances can often immediately start investigation down fruitful channels. In the data that follows, this time profile will constantly be emphasized.

Ocular Headache

Probably one of the commonest causes of ambulatory headache is ocular.

Myopia. People who are nearsighted, seldom, if ever, have symptoms of eyestrain. They cannot see well for distance but can and do use their eyes for near, with or without their glasses, with no discomfort whatsoever unless overcorrected. A myopic person whose spectacle correction is too great for his needs becomes artificially farsighted and may have all the discomfort incident to uncorrected farsightedness.

Hyperopia. This group of farsighted people includes presbyopes, those who become farsighted for near objects, about age 45. The hyperopic headache usually begins about noon or mid-afternoon and continues until relieved by sleep. Not uncommonly, it is brought on by use of the eyes for near vision in the evening when reading by artificial light. Eyestrain headaches are, almost without exception, produced by use of the eyes for near vision. People whose occupation does not require use of their eyes within arm's length seldom have headaches of ocular origin even though they have large, uncorrected refractive errors. Some individuals will read at night and awaken with a headache the next morning. Others may wake up around 4:00 A.M. with dull pain in their eyes. These symptoms are related to accommodative fatigue and disappear under proper management.

Children. Children often complain of headache. The author has yet to see his first child with these symptoms, positively assignable to eyestrain. Youngsters have tremendous powers of accommodation. When the refractive error in children is large enough their vision is depressed but they do not have symptoms of the adult type. Headache problems in children are in the province of the family physician or the pediatrician, unless real ophthalmic pathology is evident. Headaches in otherwise healthy children are usually emotional in origin.

Neuromuscular disorders. Vertical extra-ocular muscle deviations may produce headaches, accompanied by blurred vision. Usually diplopia is present, which may be slight and even unnoticed. Exophoria in moderate or low degree may cause ocular discomfort. Both vertical deviations and exophorias are rather rare as causes of headache. Divergent and convergent strabismus in adults does not cause symptoms.

Induced prism. There is a form of muscle imbalance that does produce symptoms. This situation is not present in the patient's native ocular stability but is "induced" by his spectacles. A spectacle correction may be perfectly ground regarding strength and axis but it may have the optical centers too wide for the patient's own interpupilary distance, or one center may be higher or lower than the other. When this disparity is great enough to produce one-half prism diopter of imbalance the glasses may produce symptoms even though the basic refractive correction is adequate. This is called inherent or induced prism and has the effect of producing in the wearer a muscle imbalance he cannot tolerate. This is by no means a rare cause of headache. It may occur or be produced in any pair of spectacles with a different prescription for each eye. Many people can tolerate this imbalance without symptoms, on the other hand, many have symptoms which too often are relegated to the "catch pot" of functional disorders because they have "the right prescription." It has been said elsewhere, 50 per cent of unsatisfactory glasses are that way, not because of a poor refraction but because of unrecognized inherent prism. The symptoms produced are exactly similar to those of eyestrain created by uncorrected hyperopia.

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Ciliary hypertonicity. There is a group of individuals who have a typical time profile for hyperopic ocular headache. Dull aching pain located in their temples or forehead, getting gradually worse as the day progresses and made worse by reading in the evening by lamplight. Usually they complain of some "smarting and burning." These people also have an increased winking reflex, mild conjunctival hyperemia and from two to two dozen pair of glasses, containing all types of correction, none of which help. Ages usually range from 18 to 40. Examination under full cycloplegia reveals a low or no refractive error. This symptom pattern is referred to as ciliary hypertonicity—eyestrain without a refractive error. For some reason these people develop an accommodative discomfort and a corneal conjunctival irritation. Treatment with one-half per cent homatropine each night on retiring and some mild anesthetic-astringent drops during the day, carried out for a month, will relieve these people completely of their discomfort.

Allergies. Low grade corneal conjunctival allergies are a common cause of ambulatory headache. The onset, duration and character of the pain varies with the allergen. The irritation produces a mild conjunctival hyperemia on the lids and bulbi. This roughens the lids which in turn irritates the cornea and increases the blink reflex. With this increased blink reflex orbicularis oculi spasm follows and this in turn creates a headache in the frontal facial area, accompanied by a burning, smarting sensation in the eyes. Again, the time of occurrence is important. In men and women, cosmetics are commonly the cause, the smarting, burning and headache occur thirty minutes to an hour and a half after application. Pollens may produce a seasonal disturbance. Most often these people show little if any other evidence of sensitivity. This ocular allergy is quite low grade and seldom gets worse. It also seldom gets better unless the offending contact agent is ferreted out.

Glaucoma. Primary glaucoma, in its incipient forms, may cause headache. The author has seen a few patients with a dull, mild headache, indefinite in time of occurrence and duration and relieved when controlled by miotic therapy. Acute high tension or "absolute" glaucoma produces a severe headache. The onset of the headache is rather sudden following the acute rise in intra-ocular tension. Once established, it is constant and nagging. The patient frequently complains of having a "hair in her eye," but why this terminology is selected is not clear. The pain may or may not be too severe in or about the eye. The headache is usually parietal, on one side or the other, not necessarily on the side of the involved eye. The eye is acutely inflamed, stony hard, and vision is reduced to darkness or light and motion.

Acute glaucoma, uncomplicated, occurs most commonly in the fifth, sixth and seventh decades in apparently normal healthy people. Untreated patients in their seventh decade can, because of this glaucoma headache, go into a state of acute inanition, acidosis and expire. Hemorrhagic glaucoma, the glaucoma that follows untreated central retinal venous thrombosis, may follow a course like that of acute primary uncomplicated glaucoma. There is this difference: a normal healthy eye suddenly loses most of its sight, gets along well for a few to several months, then (when the tension starts to rise) develops pain which like primary acute glaucoma, persists with an aching, nagging chronicity, ultimately requiring surgical intervention for relief.

Iritis. The headache of iritis is one of the few headaches of ocular origin directly and dramatically related to the eye. The onset of iritis is acute—hours to one or two days. The affected eye is inflamed and sensitive to light. The pain is deep to the eye and in the forehead and face about the orbit. The pain is mild to severe, depending on the severity of the inflammation, and constant. It may throb. Light makes this pain worse. It may be so severe morphine is required. As soon as the iritis is brought under treatment by atropine, salicylates and foreign protein therapy the headache is promptly relieved. That this head pain in and about the eye is associated with ciliary spasm and edema of the ciliary body is proven by the prompt relief brought on and maintained with adequate use of atropine, a ciliary antispasmodic. Iritis is an odd disease. It occurs spontaneously in an otherwise healthy normal eye in adults of any age. Bacteria cannot be cultured from the anterior chamber at any time. It is thought to be a type of the little known focal immune-allergic reaction, and occurs commonly in patients with a previous history of rheumatoid arthritis. Most often the cause is unknown.

Iritis usually runs a self limited course of six weeks to three or four months and tends to recur. Treatment is directed toward ameliorating symptoms and salvaging sight. On occasion, glaucoma may develop in the course of iritis. When this occurs, pain in the head about the orbit becomes severe. It may or may not radiate elsewhere. Treatment is directed to the primary cause.

HYPERTENSION

The headache of hypertension is characterized by pain, fairly diffuse, or it may be focal, present on arising each morning. It is usually throbbing. It may wake the patient up or he may awake with it. It is relieved by aspirin although it usually disappears spontaneously after the patient is up, dressed and has had his coffee. Hypertensive headache may be absent during the rest of the day, or reappear at any time in the presence of excitement or emotional stress. These patients see the ophthalmologist because their headache is located back of the eyes or in the occiput. Examination usually reveals no refractive error or one well corrected. Retinal vascular changes, almost invariably present, lead one to further studies which uncover the hypertension. The mechanism is not well understood.

Cervical Arthritis

One of the more uncommon types of headache is produced by cervical arthritis. This entity whatever the cause or type frequently produces spasm in the muscles of the neck. Pain usually begins here and radiates up into the occiput and may even extend into the fronto-parietal area. The headache may be unilateral or bilateral. Diagnosis is made by history which is typical for arthritis in the cervical region—postural pain, limitation of motion and relief with salicylates. It is surprising how little regard these patients have for the primary pain in their neck and how concerned they get over the incident headache.

Brain Damage

The term brain damage is used here to denote the presence of pathological intracranial processes. Where possible etiology will be considered, however, it is not in the province of the ophthalmologist to assign etiology to cerebral pathology, but rather to recognize its presence, such information to be used as a guidepost for further study.

Infections and Space Consuming Lesions. In the author's experience, brain damage as a cause of headache is quite uncommon, probably the least common cause of ambulatory cephalalgia. Further, may it be said that not all brain damage causes headache. Intracranial pathology causes headache only (1) when tension or a pull is placed on the meninges or larger vessels either by a generalized increased intracranial pressure (meningitis) or by a local pressure (subdural hematoma or expanding tumor); or (2) when there is a disturbance in the peripheral function of cranial nerves incident to intracranial change. Usually, when intracranial disease is sufficient to cause headache, there are other dramatic neurologic changes which far overshadow the cephalalgia as a diagnostic sign. Such changes are peripheral sensory or motor disturbances, changes in the sensorium, diplopia, visual field changes, high fever with neck rigidity and Jacksonian seizures.

Post traumatic syndrome. There are two exceptions to the above which are more commonly seen, are ambulatory and should be recognized. The first is the post traumatic syndrome.

Case 1. An example of the first type is M. B., a twenty-seven-year old white electrician in previous good health, who fell from a scaffold about six feet high. He struck his head over the right parieto-occipital region. If he was unconscious it was for not more than one or two minutes. He was immediately dizzy, lightheaded and felt nauseated. He did not vomit. He was taken to a local physician who examined him and found nothing of note. X-rays of his skull were negative. Blood pressure was 130/74 and urine and blood studies were not significant.

The patient was sent home and told to stay in bed for a day or two, following which he was to report back to the physician. Two days later his wife called the physician to make a house call, stating the man was too weak to come to the office. At this visit the patient was in bed complaining bitterly of a severe generalized throbbing headache which had been present since shortly after the injury. He had had no fever, took little food but took fluids well. The man looked ill but physical examination at this time was entirely negative. Nothing gave much relief from his headache including codeine or morphine. The patient gradually improved over a period of eight months. During the long convalescence the four typical signs of post traumatic change appeared. They were (1) severe headache not amenable to relief, (2) emotional instability, (3) intolerance to alcohol and (4) rapid fatiguability. He gradually improved, his headaches subsided and he became less irritable. During this time he was seen in this office. His vision was normal and his muscle balance, fields and fundi were without change. In a year's time he was fully recovered.

Unless acquainted with this syndrome, it is easy to call the type of problem functional, yet a normal healthy robust male doesn't become what appears to be a neurotic over night. During World War II many such cases were badly mismanaged because the picture was not well understood. These people are ill and when forced into more activity than they can tolerate, their symptoms get worse. They will improve, most often completely, but six months to a year should be allowed for complete recovery. The headache in this picture is associated almost completely either with fatigue or any emotional stress. The pathology is thought to be in the nature of petechial hemorrhages probably in the midbrain about the aqueduct.

Minor Apoplexies

The second exception is the minor apoplexy. Alvarez has given this much thought and recently clearly established it as a definite clinical entity. Briefly the brain sustains minor vascular insults in the form of small hemorrhages. These are by no means killing blows, rather "death takes a little bite" out of the patient's brain. It is contended that major cerebral hemorrhages *per se* seldom occur, rather the fatal bleeding is the end of a long series of minor accidents. These small hemorrhages may begin as early as the third decade of life. They are, however, much commoner in the fifth, sixth or seventh decades.

The symptoms obviously can be manifold depending upon the location. When this small hemorrhage occurs, there is usually an attack of dizziness, headache or fainting. The blood pressure falls, even though not previously elevated. The patient may or may not lose consciousness but always shows evidence of a sudden cerebral disturbance. Following the acute phase he may develop a chronic persistent headache, or a recurrent burning pain in and about his forehead and face or one side or the other. If the lesion is in the midbrain, which it commonly is, the patient develops eye signs along with his head pain which will facilitate localization, *i. e.,* if anteriorly located he may exhibit decreased convergence with no limitation of lateral gaze. Nystagmus is present but to a lesser extent than when posteriously located.

If posteriously placed, he will demonstrate good convergence, nystagmus and paresis of one lateral rectus and the opposite medial rectus. This produces a conjugate paralysis of gaze to one side. Often pyramidal tract signs are present. Quite often localization can be anticipated if the patient is seen early. Field changes, conjugate deviations, aberrant motions of command, following motions and convergence often appear soon after the accident and disappear later. The symptoms of headache, vertigo, loss of appetite and feeling of well being, however, persist. The patient suddenly seems much older. The prognosis is poor. The patient will not recover from his present symptoms and will have more accidents which will cause further crippling.

Case 2. R. R., a forty-six-year old successful white salesman for building equipment suddenly developed what appeared to be an acute circulatory collapse. His blood pressure, checked in the recent past, was 130/70. At this time it dropped to 90/40. There was no chest pain, in fact no pain at all except a dull headache. Repeated electrocardiograms were negative. The patient was hospitalized and treated conservatively. Neurologic examination revealed hyperactive reflexes but nothing else of note.

After a hospital stay of two weeks he was discharged home somewhat improved. His blood pressure rose to as high as 90/60 and has stayed there. He had a continuous dull headache and was unable to do the least amount of work. The man was seen in this office three months later, still complaining of a persistent dull occipital headache, fatigue and inability to work. He states he is unable to think straight and develops an overwhelming fatigue with the effort. In short, he has lost his zest for living. Examination revealed no ocular evidence of intracranial change. This is the typical picture of a minor apoplexy. This man will not improve much, will have repeated minor apoplexies, one of which will be terminal.

Headaches of Functional Origin

This loose and poorly stated subgroup contains the headaches not assigned above. Originally, it contained almost all headaches with exception of a very obvious few. As more and more careful observations are made, this group contains fewer and fewer headaches and, it is this author's profound hope, someday may be reduced to the vanishing point. Major in this group are the so-called tension headaches, ophthalmic migraine and the poorly understood histamine cephalalgia.

Tension headache. Many individuals, chiefly active, conscientious, intelligent women in their thirties develop headache in or behind their eyes. This headache has a slow onset, two to eight hours, no aura, and is bilateral. Use of their eyes may or may not make it worse. The headache gradually increases in intensity until the patient has to go to bed. At its peak, there may be some nausea, and occasionally vomiting. Light bothers the patient's eyes. This head pain lasts twenty-four to forty-eight hours and clears spontaneously. During the attack it is interesting to note these patients get no or only slight relief from any medication. Aspirin, codeine and morphine do little but increase the nausea. Sedatives such as the barbiturates or bromides offer more relief. The incidence of tension headaches varies with exposure to events which tend to set up or increase her anxieties. Small children, discord in the home, and financial worries are the commonest inciting events.

Not uncommonly these women develop headaches about the time of ovulation and during menstruation. They may have one or two headaches a week or only one or two a month. Some may have a mild headache all of the time which becomes worse at intervals. Treatment is directed toward mild sedation and psychic ventilation plus a lot of reassurance that there is no evidence of brain tumor or other underlying dramatic pathology. These people are most grateful for any help received and have usually seen several physcians who, following a thorough physical, have summarily dismissed them as having no real disorder. Real or not, they still have symptoms of a most aggravating order. The most difficult part for the physician treating this tension headache to decide is — does this woman *want* to be relieved of her head pain. Though they swear they must get relief, many do not want help because their headache serves a very useful purpose in maintaining their place in the sun.

Migraine. Whatever the etiology of migraine, the diagnosis is not difficult. There is the aura, usually visual such as flashing lights or tubular vison, or other sensory changes followed by a headache over one half the head. There is nausea and often vomiting. Patients seen in this office usually have pain in and about one eye. There is often some conjunctival redness and on occasion the eye may be quite red and photophobic. The head pain is dull and throbbing at first, getting progressively worse. Often there is an area of severe pain which can be covered by a silver half dollar. Little or no relief is obtained from sedatives or narcotics. Relief, in the majority of cases, can be obtained by one of the ergot preparations followed by sedation. Ergotamine tartrate (gynergen) intramuscularly and dihydroergotamine (DHE-45-Sandoz) intramuscularly or by the intravenous route work well. It is paramount that treatment be started as soon as symptoms begin. For this reason, ergot parenterally is not always feasible. Ergotamine tartrate and caffeine (cafergone-Sandoz) can be given by mouth and, if taken early, when symptoms first appear, often suffices. Ergot preparations will permanently relieve the immediate attack but should be followed by sedation (3 gr. sodium amytal-Wolff.) Fatigue is related in some way to this syndrome, therefore eight to twelve hours of uninterrupted sleep is of much value.

Other Miscellaneous Headaches

There are other headaches not described above which the author cannot catalog.

Histamine headaches are now being described. Whether or not this type is a part of the migraine or is a separate entity is not known. Horton believes he has obtained some results by desensitizing them with histamine. One type is described as a sharp, piercing pain located in one eye. The onset is sudden and the eye becomes red. The pain is excruciating but lasts only a few seconds and stops as quickly as it came. No comment can be made as no experience has been had with either observation or treatment.

Atypical facial neuralgias are chronic, dull and follow no nerve pattern. The author has not had occasion to observe or treat this complaint. Tics are not discussed here as they are not seen by ophthalmologists except on the rarest occasions.

Triggering Mechanisms

It is believed, though still unproven, that many if not all headaches are set off by some triggering mechanism. Often a patient with recurrent headaches, not related to the use of his eyes, will have far fewer attacks when his refractive error is properly corrected. This carries into the tension and migraine zones. T.J.B., a physician, had recurrent migraine for years. His attacks were typical and included an aura, nausea, vomiting and hemicrania. He was refracted for other reasons and, since that time has had little or no trouble. By no means is it contended that all of these headaches are due to eye strain but rather that they are set off by some irritation which can start head pain. Sinus disease, infected or carious teeth, and, probably the commonest of all triggering mechanism—fatigue, and exhaustion can start the headache going.

Summary

The clinical nature of some ambulatory headaches seen in ophthalmic practice has been discussed from the standpoint of differential diagnosis. Included are: localization, ocular headaches, hypertension, cervical arthritis, brain damage, headaches of functional origin, other miscellaneous headaches, and triggering mechanisms.

Conclusions

Differential points in the diagnosis of some types of ambulatory headache have been given in an attempt to establish clinical etiology in as many as possible. Earlier it was prefaced that many headaches were sent to the ophthalmologist in an effort to assign cause. This study attempts to demonstrate where a survey of the ocular mechanism can be of help either for relief of symptoms or for diagnosis. The location of the headache has been little regarded. For diagnosis emphasis has been placed on the time profile of the headache, response to drugs and the reaction of the rest of the organism to or during the headache. Triggering mechanisms are discussed. The above observations are all of clinical nature.

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Surgery does the ideal thing—it separates the patient from his disease. It puts the patient back to bed and the disease in a bottle.—Logan Clendening, M.D.

A Preliminary Report of Twenty Patients Treated with Δ 5 Pregnenolone and Remissions in Rheumatoid Arthritis Following Gold Therapy

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DURING the past ten years, over 1500 courses of gold therapy[1] for rheumatoid arthritis have been given at the Arthritis Clinic of Philadelphia General Hospital and of Jefferson Medical College Hospital, Philadelphia, in the Philadelphia Police and Fire Department and in private practice. Recent favorable reports of the use of cortisone,[2] of adrenocorticotropic hormone (ACTH),[3] and of pregnenolone[4] make appropriate a comparison with the results of gold therapy in this series. Since this group is large, although many of the patients are not available for recent follow-up, those who are constitute a representative cross-section of the whole from which valid conclusions may be drawn.

Although spontaneous remissions of varying lengths and even a few spontaneous cures are characteristic of rheumatoid arthritis, no statistics concerning untreated cases are available with which to compare the remissions following therapy, since denying the patient the benefit of conventional treatment is not justified. However, years of experience give the rheumatologist definite clinical impressions of comparison between spontaneous and treatment remissions. Also, it is frequently possible to gain a definite picture of the spontaneous remissions from the history of the case before therapy and to compare this picture with that after therapy. Comparison of one form of therapy with another, however, can be made on a definite mathematical basis if groups of comparable and adequate size are selected. The purpose here is to present data concerning remissions and cures following gold therapy in this large series with which results of other forms of therapy may be compared, when comparably large groups have been observed over comparable periods, as with ACTH, adrenal cortical extract, cortisone, desoxycorticosterone acetate, pregnenolone, progesterone, estradiol, testosterone and several other steroid substances that have been reported to be useful in treatment of rheumatoid arthritis.

The group reported here consists of 475 patients given a total of 721 courses of gold therapy and followed for as long as seven years. A course of gold in earlier reports concerning this group consisted of intramuscular injections of 10 mg., twice weekly, 4 doses; 25 mg., twice weekly, 4 doses; 50 mg., twice weekly, 4 doses; and 100 mg., weekly, 9 doses — a total of 1240 mg. For the past three years the course consists of 10 mg., twice weekly, 4 doses; 25 mg., twice weekly, 4 doses; if improvement is shown at this point, the dosage is not increased, but 25 mg. is given weekly until a total of 790 mg. is administered; but if there is no improvement, 50 mg., twice weekly, 4 doses; 50 mg. weekly, 9 doses— a total of 790 mg. The 100 mg. dose has been discarded entirely.

Of these 475 patients, 389 responded to request for follow-up and are now under observation. Many are still in remission. Of these 389 patients 180 (46 per cent) had remissions of from one to seven years. This percentage of patients having remissions can be applied approximately to the entire group of 475, since all but 86 (12 per cent) are included in the follow-up. Almost one-half of rheumatoid arthritics given adequate gold therapy may, therefore, be expected to respond by remissions of from one to seven or more years.

Table I lists the numbers of males and females, below and above age 40 who had remissions of more than 1, 2, 3, 4, and 6 years, following 1, 2, 3, 4, 5, and 7 courses of gold therapy.

TABLE I

Remissions in 389 Rheumatoid Arthritics Following Gold Therapy

No. of Courses	Sex	Before or After 40	Number of Patients with Remissions of more than YEARS						Total Patients
			1	2	3	4	5	6	
1	M	B	1	2	1	1	4	2	11
		A	3	4	1	6	7	5	26
	F	B	3	3	5	2	12	3	28
		A	3	10	9	5	15	8	50
2	M	B		3	1	1	1		6
		A	3	1	3	3	2	3	15
	F	B	2		1	1	3	2	9
		A	1	7	1	2	6	1	18
3	M	B			1	1			2
		A	1	1	1		1		4
	F	B	1	1					2
		A						1	1
4	M	A				2			2
	F	A			1		1		2
5	F	A		1		1		1	3
7	F	A		1					1
Totals			18	34	25	25	52	26	180

A certain percentage of cases may remain in remission indefinitely. A patient is considered to be in remission when he is free from pain and stiffness, is no longer markedly affected by changes in weather, and when his blood count and sedimentation rate have returned to normal, even though he may have residual deformities. If, however, there is no residual swelling or deformity, the term "cure" might be cautiously used.

Little is known concerning remissions resulting from cortisone and ACTH therapy beyond the fact that they are short. Control of pain and swelling and increase in motility of the affected joints appear to require almost continuous therapy with these new remedies. This continuous use has been reported to result in undesirable reactions, including Cushing's syndrome, a condition much more serious than rheumatoid arthritis. For these reasons, in addition to the unavailability and expense of cortisone and ACTH, search is being made for a more available and economical steroid that will control the symptoms and progress of rheumatoid arthritis without these untoward actions.

During the past decade with the advent in clinically adequate quantities of the various steroid hormones, each in turn has been applied to the treatment of various forms of arthritis. Ten years ago these clinics reported[5] the value of estradiol in treatment of atrophic arthritis of the menopause. Amelioration of atrophic arthritis during pregnancy suggested the use of progesterone[6] and other corpus luteum preparations. For the past several years testosterone, estradiol and desoxycorticosterone have been used here as adjunctives to gold therapy. Ten years before the recent favorable reports on the use of cortisone, whole adrenal cortical extracts[7] were used with benefit in chronic arthritis. It would appear from favorable results from these several steroid hormones that their action may not be specific against the arthritic process and that any one of several may be expected to give as much relief as any other. Among the several steroids under test here is △5-pregnenolone which we have now used for the past six months in 20 patients in dosages of from 0.3 to 12.0 gm. over periods from one to 131 days. Of the 20 patients with pregnenolone, 12 were markedly and three slightly improved, two showed no improvement, one had one injection, and treatment was discontinued in one, who showed allergic swelling of the lips, and in one who developed an abscess at the site of injection. Several patients responded to therapy immediately and dramatically. Uniformly, swelling and pain were relieved promptly, and activities impossible for years were engaged in. Present usual dosage is 300 mg. intramuscularly daily. Several patients have continued on this regimen for more than 40 days with no toxic or untoward reactions, except for one allergic case, which was probably due to the menstruum. Three patients have maintained improvement on doses of 300 mg. administered twice weekly. Another publication will give clinical details on these patients, 75 per cent of whom showed favorable response to high dosage pregnenolone therapy. Since it is at present impossible to predict response in a rheumatoid arthritic to any therapy, it seems probable that optimum therapy for this condition may be a combination of gold with certain steroids. Such various combinations are at present under study here.

SUMMARY

1. Approximately one-half of a large group of rheumatoid arthritics on gold therapy showed remissions of from one to seven years and more.

2. A preliminary report is made on the treatment of 20 rheumatoid arthritics with △5-pregnenolone. Striking improvement with a minimum of untoward reactions was obtained in 75 per cent.

3. Until similar data are available concerning the more recently proposed steroids and cortical stimulants, gold remains the most efficacious, single remedy in rheumatoid arthritis.

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△5-pregnenolone (Prenolon), estradiol benzoate (Progynon-B), testosterone propionate (Oreton), desoxycorticosterone acetate (Cortate), progesterone (Proluton) were supplied by Schering Corporation, Bloomfield, New Jersey, through the courtesy of Dr. William H. Stoner.

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Treatment of Pruritus Ani, Vulvae et Scroti

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Of all the distressing conditions seen by the dermatologist, one of the most common is that of pruritus affecting the anus, vulva or scrotum. Irritation usually spreads from the anal to the genital regions or vice versa because of the proximity of these areas and inclination of the patient to relieve the irritation by scratching. If treated promptly, these forms of pruritus disappear rapidly, but if the condition is not checked, treatment becomes difficult and, in many cases, prolonged.

In a series of 56 cases, application of an ointment containing a local anesthetic, an astringent and a mild antiseptic agent was employed with varying degrees of success. The ointment, made up of Benzocaine 5 per cent, Ephedrine Hydrochloride 0.1 per cent, Oxyquinoline Sulfate 1 per cent and Ichthammol 1 per cent in a petrolatum and anhydrous lanoline base, was used to relieve itching, to help dry the lesions and to prevent spread of the causative factor in one application. Treatment was initiated with x-ray therapy, followed by regular application of the ointment.

ETIOLOGY

The etiologic factors in cases of pruritus in women seem to arise from the menstrual and climacteric states. In men, the most common causes of pruritus are overindulgence in alcohol, tight-fitting underwear, perspiration (especially in obese persons), uncleanliness, and, paradoxically, excessive use of harsh soaps. Other causes in both sexes may be seborrheic dermatitis, psoriasis, diabetes mellitus and pinworm infection.

TREATMENT

Sparse initial application was recommended to determine sensitivity to the medication. If lesions flared up, a patch test was made on the flexor surface of the forearm and, if positive, treatment was discontinued. In the entire series, only five, or 8.6 per cent, showed such sensitivity.

Patch tests can be made prior to treatment, but since the condition causes great discomfort to the patient, treatment was usually started at once. Patients were instructed to apply the ointment both morning and evening during the course of treatment. In about 70 per cent of all cases treated, 50 r (100 kilovolts) unfiltered roentgen ray therapy was given every two weeks.

Of the 56 cases treated, 12 had pruritus scroti; eight pruritus vulvae; 20, pruritus ani et scroti; and 16, pruritus ani et vulvae. Table I shows results of the treatment according to number of patients and degree of improvement obtained.

TABLE I

	No. of Cases	Cleared	Moderate Improvement	No Change
Pruritus scroti	12	6	5	1
Pruritus vulvae	8	3	3	2
Pruritus ani et scroti	20	12	4	4
Pruritus ani et vulvae	16	8	3	5
Total	56	29	15	12

In this series, eight cases showed no clinical classification except an intense pruritus. Two patients with trichomonas vaginitis were observed and treated, but no relief was obtained for them because of the deep-seated infection. Three patients with mycotic infection also did not respond to therapy. Two specific cases in which good results were obtained are cited.

Case 26. A. M., female, age 42, was examined on September 23, 1949. Except for intense pruritus of the vulva and anal area, physical examination and history were negative. The condition was of five days duration. The area was exposed to 50 r 100 kilovolts unfiltered radiation, followed by application of the ointment. The patient was instructed to apply the ointment both night and morning. When she returned two days later, the intense itching had been relieved and, except for brief periods of minor discomfort, she was apparently well. Treatment was continued for five days more. At the last visit, one week after initiation of treatment, itching had ceased entirely, inflammation had disappeared and the patient was discharged.

Case 41. B. E., male, age 33, complained of intense inflammation and itching of the scrotum, penis and anal region. Physical examination showed an obese individual weighing 278 lbs. who was perspiring profusely despite cool temperatures. The pruritus had persisted for several weeks during which the patient tried self-medication without results. Treatment was initiated with 50 r, 100 kilovolts unfiltered radiation, after which the ointment was applied liberally to the areas involved. The patient was instructed to apply the ointment night and morning. Four days later, the condition had improved and the patient was more comfortable. Another x-ray treatment was given and continued application of the ointment recommended. A week later the patient was discharged as cured.

SUMMARY

A series of 56 cases of pruritus ani, vulvae et scroti were treated with an ointment containing a local anesthetic, an astringent and a mild antiseptic in a base of petrolatum and lanolin (anhydrous). In 70 per cent of cases, patients received 50r (100 kilovolts) unfiltered radiation every two weeks during the course of treatment with the ointment.

The condition cleared entirely in 29 or 51.8 per cent of cases, while 15 or 26.8 per cent showed moderate improvement, and 12 or 21.4 per cent showed no change.

The relative value of the roentgen therapy and the application of the ointment* was not determined.

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*The material used in this study was Derma-Medicone, supplied by the Medicone Company, New York, N. Y.

The American College Health Association— Its Progress, Problems and Prospects*

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The American College Health Association, by present day standards, has had a long and eventful history. The first annual meeting of the association was held in Chicago at the Hotel Sherman on December 31, 1920. At this organization meeting, at which about 40 persons were present, it was decided that membership in the organization was to be institutional in character and an invitation was extended to other colleges and universities to join. Dr. Warren E. Forsythe of the University of Michigan was the first secretary-treasurer. He listed 53 institutions as charter members of which 43 have retained their membership to this day. The organization has grown from the original 53 to 228 accredited institutions of higher education in Canada and the United States and 15 additional ones have applied for membership.

The Association has met 28 times in the 29 years of its existence. Seventeen of these meetings have been held in New York City and 11 meetings have been held in other cities: Chicago (twice), Cincinnati (twice), New Orleans, Washington, D. C., St. Louis, Ann Arbor, Minneapolis, Detroit and San Francisco.

The interests of the organization have covered a broad field—in fact almost everything concerned with the health of college students has been considered in the various meetings of the Association. The accomplishments have been many. The Association has concerned itself with the hygiene of physical education and athletics. Injuries received in athletics have been given special attention and agitation in favor of adequate medical supervision in sports and other activities has been strongly recommended. The situation has improved greatly in this regard due, in some measure at least, to the constant needling of coaches and physical directors by members of various health services. Medical examination before participation in physical activities has been strongly urged and rather generally followed in the colleges, at least.

The contribution of this Association to the control of tuberculosis among college men and women has been outstanding. In the past tuberculosis took a heavy toll of young people during and immediately following their college careers. The tuberculosis committee of this Association did pioneer work in case finding techniques. In some respects this committee made contributions to the case finding programs now followed in communities.

Mental hygiene has been of interest to our membership since the very first meeting when a paper on "Mental Hygiene in its Relation to College Students" was presented by Dr. Frankwood E. Williams (published in the *American Journal of Public Health,* April 1921). Numerous papers on this subject have appeared in our Proceedings year after year.

The Association has been interested in the teaching of health since its foundation and many papers on this subject have appeared in its Proceedings. Agitation for more health instruction in colleges has resulted in the offering of more courses than there were physicians available to teach them. This has resulted in the specialty of health education which is spreading throughout the colleges and universities. In addition to this, the principle of health service administration from an educational point of view has always been emphasized. This principle is well accepted by the membership.

Among the important contributions of this Association to the college hygiene program was the leadership demonstrated in the three national conferences on health in colleges. The first of these conferences was held in Syracuse, New York, May 5-9, 1931, the second in Washington, D. C., December 28-31, 1936, and the third in New York City May 7-10, 1947. The Proceedings of these three conferences, published by the National Tuberculosis Association, have been guides for most college health programs here and in Canada.

The increase in prestige of this Association is evidenced in a number of ways. For instance, we are asked to cooperate in many national conferences concerned with health.

A change is taking place in the nature of our organization. At the 27th annual meeting held in San Francisco on December 30-31, 1948, a spirited debate took place on the question of a change in the name of the organization. Some thought that the name should indicate an organization of college health services. The majority, however, voted the present name of the Association with the thought that we should broaden our interests to include health education, cooperation in guidance, physical education, sanitation and a number of other activities associated with the health of the individual.

As a result of a broader outlook in the college health field assumed by the membership the individuals who attend our meetings will, no doubt, want sections of particular interest to them. This will probably complicate program building and program committee work.

The American College Health Association has 16 regional sections. Some of these sections are quite active while others hold no meetings. At the present time we do not have a committee on sections because we have been unable to find anyone who will serve as chairman of such a committee. The leaders of the Association have long realized that the sections are valuable assets to the organization. New members are often brought in via the sectional route. Since valuable contributions are frequently made in sectional meetings, a summary of the transactions of such meetings should be published in our Proceedings and outstanding papers presented in sectional meetings should be printed in their entirety in the Proceedings. We urge that meetings be held in each of the 16 sections and that a report be made to our secretary on each meeting.

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*Presidential address, delivered at the last annual meeting, American College Health Association.

Certain problems concerned with the workings of the organization should receive attention. For example, convenience would be served if the chairmen of the standing committees were members of council. This would increase the council membership by about a dozen people but a more effective organization would result. Questions arise in council meetings which could often be answered if a representative of a standing committee were present. Also appropriate committees could receive suggestions or questions presented for study. Our organization is becoming so large and so complex that a more representative council should be formed.

It will probably be necessary to hold interim council meetings to carry on the business of the Association. As it now stands the president and secretary hesitate to make decisions because of the traditionally long periods between council meetings. The organization is becoming so large and its inter-relationships with other organizations so complex that better integration is desirable.

The council at its meeting last evening decided to change the time of the next meeting to May 1951 because the majority of the membership favored a change of annual meeting time from December to May. It is to be hoped that this change will bring about a larger attendance at this annual meeting.

The future of the Association looks bright. No doubt we stand on the threshold of a new era. There are many problems which still confront us in student health work and our organization will continue to provide its customary leadership in this field.

American College Health Association News

Sixty-three delegates attended the annual meeting of the South Central Section held at Southwest Missouri State Teachers College, Springfield, on April twenty-ninth. The secretary-treasurer, J. Ralph Wells, M.D., Kansas State Teachers College, reports an excellent meeting, one of the best the section has ever had, considerable interest being shown in the program and in possibilities for improving the work of the local group and of health programs in the colleges in the area.

"Mental Health Programs for College Students" was the topic for the morning session. Three speakers presented papers and several psychiatrists and directors of health service discussed the college mental health program, which was followed by questions and general discussion. In the afternoon session several pertinent student health problems were presented and discussed.

The following officers were elected for the coming year: President, William Taylor, M.D., Missouri Southwest State Teachers College; vice-president, B. W. Lafene, M.D., Kansas State College of Agriculture and Applied Science; secretary-treasurer, Mrs. Bergquist; and delegate-at-large, H. M. Hardwicke, M.D., Stephens College.

Dr. Lafene's invitation to hold the next annual meeting at Kansas State College in Manhattan in the spring of 1951 was accepted. A committee chaired by Paul F. MacLeod, M.D., University of Missouri, was appointed by the president, S. I. Fuenning, University of Nebraska, to revise the constitution and by-laws of the organization.

On May twenty-seventh, the New England Section of the ACHA was reactivated. On invitation of the president and Dr. Joel J. White, director of student health, the representatives of twelve colleges and universities met at the University of New Hampshire. Part of the day was devoted to a discussion of formally organizing the section and to plans for the 1952 conference of the ACHA which will probably be held in Boston. Dr. Dana L. Farnsworth of the Massachusetts Institute of Technology presented the "Early Signs of Emotional Disorders in Students." Other topics of interest and value were informally discussed. E. J. Radcliffe, M.D., Director of Student Health, University of Massachusetts, was elected chairman of the section. The next meeting was tentatively arranged for December 2, 1950, at Vassar College.

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The Rocky Mountain Section held its ninth annual meeting on May the thirteenth at Colorado College, Colorado Springs, with an attendance of thirty-six representatives from eight universities. Dr. Lawrence W. Holden was elected to the presidency of the Section for the coming year. The next annual meeting is scheduled for the spring of 1951 on the campus of the University of Colorado.

Dr. Roger Whitney of Colorado College, also president of the Section, sent an excellent summary of the conference. Dr. Kenneth J. Loder, Colorado College, discussed "The Management of Psychiatric Problems in the Small College." In the discussion which followed, the importance to every college of working out some system of making counseling available was further emphasized.

(Continued on page 277)

The Place of Health Education in a College Health Program*

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Our modern concept of health has undergone a great transformation. It has grown to encompass a broad constructive program beyond diagnosis and therapy of diseases. The health educator has joined forces with the university physician, the dean, the administrator, and others in promoting health—mental, emotional, physical, social. In our colleges, health education attempts to help all students assume responsibility for their own health as well as for the health of society.

The modern concept of health education recognizes the opportunities for health education that permeate many college activities and courses. This broad scope implies that education for health is the responsibility of every member of a university faculty rather than the responsibility solely of the person designated as the health educator.

In order to be effective, such a program requires cooperative planning and group action by professional personnel who have as a common objective the health and well-being of every university student. A close-working relationship between staff and administrator, each recognizing the contributions of all members of the team, can be attained when all are working on common problems and toward common goals.

The accepted method of integration is the formation of a university health committee or council with membership from various departments whose function is to determine health problems and plan for their solution. The health council should establish working relationships among the departments which contribute to the health of students. Student representation on the faculty council is highly desirable. In addition, a student health council may exist. By working together, students participate in real learning experiences for the solution of campus health problems.

The effectiveness of the college health education program requires continuous evaluation. An appraisal must be made of health education methods and materials in terms of the students' progress in knowledge, attitudes, and more particularly in the attainment of desirable changes in health behavior, which is the major objective of health education.

What Is Health Education?

Before further discussion, it seems pertinent to answer briefly the question: What is health education? The aim and purpose of health education should be to help the individual student reorganize his ideas, his thinking, feelings and attitudes, and his conduct so that promotion of health becomes incorporated into daily thinking, feeling, and more effective living. Health education, then, as stated by Nyswander is "a process of change within the human organism itself."[1] Health education succeeds only insofar as the health attitudes and behavior of the individual are changed.

The objective of health education is not the mere presentation of facts. Historically, it has been shown that knowledge does not necessarily guarantee changed health attitudes and health behavior. It is not what we know, but what we do that counts. For example, we have been teaching safety and accident prevention for many years. Have the facts reduced the accident toll? Ignorance is not usually the cause of accidents.

The concept of health education must be shifted *from* subject material *to* the learner. Interests, needs, and ambitions of people change. Consequently, health education cannot remain static. As Nyswander states: "It is a dynamic ever-changing process of development in which a person is accepting or rejecting new information, new attitudes, and new practices concerned with the objectives of healthful living."[2]

To be effective, health education must motivate the individual to modify living habits advantageously in light of new knowledge and new resources. Active participation by the learner is a prerequisite to change in behavior. Patterns of motivation vary as the human organism progresses through various experiences. Consequently, health education must take its cue from the changing interests of the individual. It must create the feelings within each individual which will stimulate a desire for more intelligent living. No change is possible until an individual has an inner desire for change.

From a survey of the literature appearing from hundreds of workshops and the reports of several national conferences, health education in colleges and universities is receiving greater attention and wider acceptance than formerly. The National Conferences have offered specific recommendations for the curriculum in health education in three areas: (1) for all college students; (2) for all prospective teachers and administrators; and (3) for the specialist in health education.

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*Presented at the American College Health Association Conference, December 29, 1949.

†Assistant Professor of Public Health, University of California.

[1] Nyswander, Dorothy. "What is Health Education," *American Journal of Public Health,* Vol. 37, No. 6 (June 1947), p. 650.

[2] *Ibid.*

THE SCOPE OF HEALTH EDUCATION

To reach the objectives of health education, a program of broad scope based upon an understanding of the motivations of students must be carefully planned. The three methods of providing health education must be considered in overall planning. These three methods are (1) classroom instruction in a basic course; (2) the integration of health instruction into other courses; and (3) individual counseling.

Basic Health Course. A basic health course for all college students entitled "Personal and Community Health" is accepted as an essential part of the college curriculum. The special course in health has many advantages. It enables a student to integrate fragments of information into a unified whole.

The impetus to the inclusion of a general course for all students has come from the three National Conferences on health in college. The Committee on Health Education for All College Students at the 1947 Conference recommended a required three or four unit course taught in classes of limited size with an exemption of certain students by means of pre-testing.

The questionnaire study on current health practices made in 1945-46 in preparation for the Third National Conference found either a required or an elective course in almost all the 300 colleges included in the study.

It is encouraging to find a new trend in emphasis in the basic health course. Formerly, the main emphasis was given to the presentation of factual information, particularly to the study of anatomy and physiology, which had no effect in creating desirable health attitudes and intelligent health behavior, both of which are basic to optimal health.

Today, students participate in identifying health problems, interests and needs. The health content is then organized in light of the accumulated data to meet the needs and interests of the particular students in each class. Only a limited part of the total field of health and disease can be studied in a one semester course. Consequently, a selection of subject matter is required. Health education has too often been cluttered with irrelevant material. With the limited time available, the course must be stripped of such non-essential material so that the vital problems of students can be adequately explored. If students participate in planning and in decisions about topics and methods of approach, they are more likely to incorporate these health concepts into their way of life.

Provision should be made for the active participation of students in functional learning experiences. The values of healthful ways of living will be more readily recognized. Scientific facts are essential, but facts should be used to substantiate health attitudes and health behavior. In our zeal to present many scientific facts to students, we have overlooked the basic principles that underlie learning. For instance, we must not forget that the student learns by doing. By actively participating—in class discusson, on a panel, on a committee exploring a problem, or in the solution of some health need—the student learns how to use information in meaningful situations. Visual aids and reference materials are useful motivations toward enrichment of the subject.

Correlation. Before taking up the question of the integration of health instruction into other courses, it may be pertinent to mention an important case of correlation between the basic health course and health service. Classroom discussion of the functions and nature of the health service offered, the need for the correction of remedial defects, the wise discrimination between proper corrective procedures, self-medication, treatment by quacks, and the correlation of instruction with special activities of the health service such as the chest X-ray program can do much to make the student cognizant of the medical care program.

Certain subjects in the college curriculum should contribute to the health education of students. The best opportunities for correlation are offered by the related fields of natural sciences, social sciences, home economics, and physical education. However, health information will lose its effectiveness unless it has definite implications and value in the particular area of course content.

The most universally accepted goal of college students, that of marriage and family life, can be cited as an example of correlation. The Home Economics Department contributes to such information as nutrition, child care, home planning, etc. Sociology presents an overview of the family and its place in our social structure. Teaching the art of human relations and helping individuals make adaptations to our complex life are offerings of the psychology department. Social Welfare and Public Health give insight into the medical care program. Reproduction and genetics are contributions of the science department.

Certain non-academic experiences can contribute to the health education of students. The provision and maintenance of an environment conducive to the promotion of optimal health attitudes and practices is a part of health education. The emotional and social aspects of the environment are not so readily controlled or recognized but have far greater implications for the health of students. The personality of the instructor and his teaching methods determine the emotional climate of the classroom.

University personnel must become conscious of health problems of students and problems inherent in the environment and must take part in helping to solve these problems. The assignments of some instructors, the tremendous pressure of work, and the tension connected with the competition for grades are contributing factors to illness of students.

The need for relaxation and play in modern times is obvious. Constructive leisure time activities are a necessity for the maintenance of a healthy and well-balanced life. Students should be encouraged to participate in physical activity and in a broad social, cultural, and recreational program.

The student health council can become, under adequate guidance, a valuable means of learning through actual experience. Students representing various major departments work together as a team to identify and solve campus health problems. Activities such as the following have been conducted by the student health council: A survey of student diets followed by an educational campaign to improve food habits; a clean campus campaign; the expansion and improvement of mental health services and program; and improved conditions of eating places adjacent to the campus.

Few colleges have given much attention to the contributions the related fields can make to health education. Incorporation of health as an integral part of certain subjects requires consistent effort. Correlated teaching cannot provide all health education to all students, but it can reinforce health knowledge and health attitudes obtained from other sources and help in achieving desirable health behavior.

Health Counseling. Health education has usually been defined in terms of health instruction. The other two aspects of the college health program, namely, health service and healthful environment, have been primarily services performed *to* and *for* students. However, it has become increasingly evident that the third method of health education known as health counseling can be one of the most effective methods for the promotion of health. Teacher-student and physician-student contacts provide superior educational opportunities when the student is in a receptive mood. The value of the individual approach to health problems is well recognized. Every member of the college staff can make a contribution to the health counseling program. More extensive health counseling is carried on by certain staff members, such as deans, physicians, physical educators, and health educators.

Health education cannot be accomplished in a hasty interview with the physician. In many instances health education in the out-patient clinic and hospital has been assumed rather than practiced. Every contact of the student with physician, nurse and clerk has an educational value at a time when students are developing attitudes toward these professional people and their services.

The health examination offers an excellent educational opportunity. Are we cognizant of the effectiveness of the examination for the student? Every student deserves an interpretation of the results. The student who has no obvious defect deserves as much consideration as the one with a rheumatic heart. A health conference immediately following the examination to sum up the findings relieves the student of anxieties concerning the unknown.

All university personnel can implement and strengthen the services of physicians and nurses by being alert to detect signs of physical disorder and psychological problems. Students can then be referred to the health service when the condition is in its incipient stages.

Teacher Preparation for Health Education

In the last few years there has been recognition of the need of preparing teachers for health education. Studies show that an increasing number of institutions of higher education are offering majors and minors in health education and are adding not only teachers but health coordinators to their faculties. Consideration is being given to improving the curriculum for the preparation of specialists in health education and of all prospective teachers.

Specialists. A survey in 1948 by the United States Office of Education of all institutions of higher education in the United States shows that 432 institutions offer a combined major in health and physical education given by departments of health and physical education. Several authorities do not approve of this practice, stating that each field requires special preparation. Separate majors in health education are now being offered by coeducational institutions only. It was found that a bachelor's degree in health education only is offered by forty-two institutions. A master's degree is offered by thirty-two, and a doctor's degree by sixteen.

DeWeese in the February 1949 issue of the *Journal of School Health* reports the changing trend between the years 1935 and 1948 in the kind of degree held by health educators. In 1938 college health educators were largely physicians, an M.D. degree being held by 71 per cent of the instructional staff in the institutions studied. By 1948, the number of health educators holding an M.D. degree had dropped to 23 per cent while the number of institutions offering health education had increased. DeWeese also found a health coordinator on the faculty of twenty-seven institutions. The degrees held by these new members of college faculties were: twelve with an M.A.; eleven with a Ph.D.; and four with an M.D. There is a trend away from the supervision of health education by the student health service.

The broad aspect of health education was recognized by the Committee on Qualifications for College Health Educators of the Third National Conference in their statement of the coordinating and administrative functions in addition to the usually accepted instructional functions of the college health educator. Minimal qualifications suggested were at least a master's degree or its equivalent for teaching positions and a doctor's degree for positions requiring administrative responsibility. In order to attain competency as a college health educator, this committee recommended preparation in broad areas of knowledge and field experience.

Another problem being attacked by college personnel is the educational preparation of health specialists for elementary and secondary schools. The National Conference on Undergraduate Professional Preparation in Health Education, Physical Education and Recreation held in May 1948 listed competencies in knowledge, skills and attitudes in each of the three major divsions of a school health program necessary for health specialists. It was also recommended that the director of the teacher education program should have an appropriate doctor's degree or its equivalent. Practical laboratory experience in college and community health agencies was considered mandatory.

The United States Office of Education invited to a meeting held in Washington, D. C., representatives of teacher education institutions which have a curriculum for the undergraduate professional education of students majoring in health education. The report of the conference will be published soon by the United States Office of Education.

Because of the need for improving the health education curriculum in colleges and universities, another conference is meeting in January, 1950, at Pere Marquette State Park Lodge in Grafton, Illinois. At this conference the graduate program in health education will be discussed.

Prospective School Personnel. With the increasing tendency of elementary and secondary schools to recognize health as a major responsibility, leaders are recommending that all students preparing for school positions should have minimal preparation in health education. Many colleges require such preparation by special courses or parts of courses. In the pamphlet, "Teacher Education for the Improvement of School Health Programs," the U. S. Office of Education makes recommendations for the educational preparation of all teachers and also for the special teacher of health education. In addition, the responsibility is placed on teacher-education institutions for the continued health education of teachers on the job.

The national organizations are concerned with professional education but in addition stress the responsibility of the university to provide an environment conducive to physical, emotional, and social health and adequate college health services for all college students.

PLACEMENT

A recent study by a Subcommittee of the Public Health Education Section of the American Public Health Association reports that 42 vacancies exist in colleges and universities in the 436 returned questionnaires. The majority require an M.A. or M.S. degree. Five require a Ph.D. degree. Approximately one-third of the reporting institutions stated that they would need additional health educators in the future. Many of the colleges and universities indicated a need for a person qualified in health plus some other related field, especially physical education.

SUMMARY

Health education has an important place on every college campus. The two older components of a college health program, namely, public health activities and health services, have been largely instrumental in protecting the health of individuals and in reducing the rate of communicable diseases. To these two well-established programs, health education has joined forces for the purpose of promoting optimal health and well-being for every student.

Because of the changing health problems in this country, a better understanding of them and acceptance of the obligation for their solution is a challenge to every college student. By a broad functional program of health education on every college campus, students will be able to assume self-direction in the promotion and maintenance of personal health and to assume some responsibility for the public health.

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Notices

The **American College of Physicians** will conduct its 32nd Annual Session at St. Louis, Mo., April 9-13, inclusive, 1951. Dr. Ralph Kinsella of St. Louis is the general chairman responsible for local arrangements and for the program of clinics and panel discussions.

★

The University of Minnesota announces a continuation course in **Neurologic Roentgenology** to be presented at the Center for Continuation Study on October 30 to November 4, 1950. Distinguished visiting physicians who will participate as faculty members of the course include Doctors Arthur E. Childe, Winnipeg; Philip J. Hodes, Philadelphia; Dabney Kerr, Iowa City; and Knut Lindblom, Stockholm, Sweden. Clinical and full-time members of the staff of the University of Minnesota and Mayo Foundation will complete the faculty.

★

Classes begin on September 11 for the second group of twelve medical record **library science** students to receive 50 weeks of specialized instruction at the U. S. Marine Hospital, Baltimore, Maryland. Application forms and full information regarding the program are available from the Medical Records Branch, Division of Hospitals, U. S. Public Health Service, Washington 25, D. C.

The seventh annual meeting of the **American Medical Writers' Association** will be held at the Elks Club, Springfield, Illinois, Wednesday, September 27, during the 15th Annual Meeting of the Mississippi Valley Medical Society. Included in the program will be Frank G. Dickinson, Ph.D., director of the bureau of medical economic research, American Medical Association, Theodore R. Van Dellen, M.D., health editor, Chicago Tribune, and Walter C. Alvarez, M.D., of the Mayo Foundation, Rochester, Minnesota, editor of the new publication, General Practice.

★

The thirty-sixth Clinical Congress of the **American College of Surgeons** will be held in Boston from October 23 to 27. Hotel headquarters will be at the Statler and Copley Plaza.

★

The third annual scientific meeting of the **Gerontological Society, Inc.,** will be held in St. Louis, Missouri, November 12 and 13, 1950, with headquarters at the Chase Hotel.

★

The **American Proctologic Society** will meet in Los Angeles July 1-5, 1950. Dr. W. Wendell Green, 1938 Parkwood Ave., Toledo 2, Ohio, is the secretary.

Book Reviews

Obesity, by Edward H. Rynearson, M.D., F.A.C.P., and Clifford F. Gastineau, M.D. Edited by Willard O. Thompson, M.D. First edition. Springfield, Illinois: Chas. C. Thomas, 1949. 144 pages, 9 figures, 16 tables. $3.50.

At a time in which more and more individuals survive infectious illness and live into the age of advanced arterial degeneration, the emphasis upon the prevention and treatment of obesity is very pertinent. The authors show the lack of validity in most cases, and state that the important causes are the endocrine, genetic, psychologic and neurogenic factors. Sound dietary control is shown in the discussion of food values, sample menus and weight charts. C. A. McK.

Die periphere Schmerzausloesung und Schmerzausschaltung (Biochemical aspects of pain), by Albrecht Fleckenstein, M.D., of the department of pharmacology, University of Heidelberg. Frankfurt: Verlag von Dr. Dietrich Steinkopff, 1950. 92 pages. Price German marks, 9.50.

This monograph in the Natural Sciences Series of the Wissenschaftliche Forschungsberichte is a pharmacological analysis of the mechanisms of pain. Pain is believed to depend largely upon the inhibition of oxidative anabolism (especially of the phases of hydrogen activation) and to be due to the accumulation of some catabolites of glycogenolysis. Enhanced catabolism follows any cell lesion and thus pain results from those metabolites which require oxygen for their elimination. Extensive experimental data are presented on the esters of monohalogen substituted acetic acids, on some aliphatic and aromatic ketones containing halogens and on a series of other halogen compounds, which all have two properties in common; they are very active in causing pain and also in inhibiting oxidations. F. H.

Helpful Hints to the Diabetic, by Collens and Boas. Springfield, Illinois: Charles C. Thomas Co., 1949. $3.00.

This book is an excellent compendium for the diabetic patient. It contains pertinent information that the diabetic should know concerning his disease and its treatment including diet, insulin, bodily care, complications, and hazards of quackery.

The book is finely printed and well illustrated and can be recommended for the diabetic patient who wishes to be better prepared to care for himself by working intelligently with his physician. C. A. McK.

Manual of Clinical Laboratory Methods, by Opal E. Hepler, associate professor of pathology, Northwestern University Medical School. 4th edition. Springfield, Illinois: Charles C. Thomas, 1949. 387 pages. $8.50.

This book is a manual of methods commonly used in a clinical laboratory. It is arranged in outline form with a step by step description of each method included. Methods are described under the following headings: urinalysis, hematology, gastric and duodenal contents, cerebrospinal fluid, sputum, liver function tests, bacteriology, mycology, parasitology, sectioning of tissues, clinical chemistry, electrocardiography, blood groups, body fluids, pregnancy tests, serology, allergy extracts, feces, and basal metabolism. Each method is discussed in regard to its essential principles, the steps in its performance, calculation and interpretation of results, and sources of error. There are eight colored plates illustrating blood morphology and malarial infestation. There are also illustrative diagrams of complicated apparatus and many charts and graphs.

Of primary advantage in a book of this type is its orderly arrangement, permitting easy access to a variety of helpful procedures. The directions are always concise and explicit. No more than one method is described for each procedure. This allows the inclusion of a wide selection of procedures and will make it a valuable aid to the busy clinician, the laboratory worker, and medical student. E. S. B.

Brain and Behavior, by N. E. Ischlondsky. St. Louis: C. V. Mosby Co., 1949. 182 pages, 46 illustrations. $7.00.

In this monograph the author proposes that a process of "induction" is one of the fundamental mechanisms of neuropsychic activity. Induction is defined as follows:

"Every manifestation of a nervous process leads, under certain well defined conditions, to the appearance of an opposite process. Thus a focus of excitation gives rise to a focus of inhibition—negative induction, and vice versa, a primary inhibitory process results in the appearance of a secondary excitatory focus —a positive induction." A stimulus "induces" an opposite response.

The author describes in detail a series of investigations supporting the above theories. Visual phenomena, especially the formation of after images, are interpreted as demonstrating induction. The suppression of pain by diverting the subject's attention with other stimuli such as a different pain, and physical effort, is another example.

Various phenomena observed in human behavior are offered as further proofs of induction. Some examples are the negative response of children to requests of their parents, the urge to defy authority, the heightened desire for objects when they become scarce, and opposition to new ideas. The author concludes with some general statements regarding the psychological and sociological significance of the mechanism of cerebral induction, the objectives of which are to adapt, regulate and protect the individual and his behavior. W. S. C.

Congenital Anomalies of the Heart and Great Vessels, by Thomas J. Dry, M.D., et al., a clinicopathologic study of 132 cases from the Mayo Clinic. Springfield, Illinois: Charles C. Thomas, 1949. 58 pages. $4.50.

For those interested in the diagnosis and treatment of congenital heart disease, this interesting monograph by the group at the Mayo Clinic is an excellent presentation of typical examples of some of the various congenital heart anomalies that have come to post-mortem at the Mayo Clinic. Each type of congenital heart malformations that has come to post-mortem is described. First, the physiological background is discussed, followed by one or two excellent color photos of wax models showing the characteristic malformations, then one or two typical histories of patients with the principal clinical features of the anomaly are shown. A brief statement is made as to the incidence, one or two pictures are shown of the gross specimens, the typical electrocardiogram and the typical x-ray are likewise illustrated. This book is not intended to be a complete discussion of these various anomalies, and for that reason, several of the important anomalies are missing. Likewise, due to the brevity of the monograph, the variations found in the different anomalies are not presented. F. H. A.

The Practice of Medicine. Jonathan C. Meakins, M.D. Fifth edition, 1950. 1,558 pages, 518 illustrations. St. Louis: C. V. Mosby Co., $13.50.

It is astonishing that a single author can keep a comprehensive treatise of medicine up to date. With the exception of several chapters by contributing authors, Dr. Meakins has written the whole text and kept abreast of new developments. The discussions of the physiology and symptomatology referable to an organ or a system preliminary to the subject matter on the diseases of that organ are unusually good.

An excellent supplement since the last edition is the section on psychosomatic medicine by Frederick R. Hanson. The psychodynamics of this group of disorders is well covered.

In the chapter on diseases of metabolism by E. H. Mason and M. M. Hoffmann, a high carbohydrate diet is rather empirically recommended for all diabetics. It would seem that relatively high fat diets have just as much virtue but this type of diet is not mentioned.

There is a good section on chemotherapy, and the new agents such as chloromycetin and aureomycin are included.—E.H.

The
JOURNAL
LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatric Society

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Editorially Speaking

THE SOCIAL RESPONSIBILITIES OF MEDICINE

One of the things that the public appears to believe is that there is an acute shortage of doctors and an undersupply of medical service, especially in the rural areas. For the moment, I am not concerned with the truth or falsity of the statement. I am concerned with the fact that the belief exists. And if the belief exists, and continues to exist, even though it be false, you and I will see action predicated on it. For that reason, it is vital to the future of the medical profession that it have available to its use the facts concerning the profession and its service to the public; and that it tell its story so clearly and understandably that no unwise action will be taken to undermine the strength and standing of your profession . . .

I do not wish to see your profession become a ward of the state, or dominated or controlled by it. Yet I fear that just that will come to pass if, for any extended period of time, the public has the conviction that there is a real shortage of doctors and an undersupply of medical service, and that the medical profession is not doing all in its power, in conjunction with all forward looking citizens, to see that the shortage is met and the need is supplied. And that the public will be appeased merely by pointing an accusing finger at socialized medicine . . .

What is the responsibility of the profession in such a situation? Surely, it has the responsibility of seeing clearly the major trends of the times, of convincing the public that it sees them clearly, and of demonstrating its readiness to take a responsible part in the solution of great social problems.

Now whether we like these measures or not, it seems probable that for a generation, at least, we shall find farm leaders and labor leaders thinking in terms of the shared risk. And it seems equally probable that any political party which closes its eyes to these attitudes will lose the support of the farmer and the laborer. Those are facts which must be faced as facts . . .

Would it not be wise, therefore, for the medical profession to show that it stands at the very forefront of our society in apprehending the nature of these social movements and in seeking solutions to the problems out of which they arise? In all candor, the medical profession, so far, has not created the impression in the public mind that it stands in the forefront in these matters . . .

Competence as a citizen will not condone incompetence in the practice of the profession. Carelessness in the diagnosis of an illness or in prescribing the therapy for it cannot be offset by punctuality at the ballot box or faithful service for the Community Chest or on the City Council. It is a special function of the doctor to prevent illness and to cure disease, and the responsibility which society expects him to accept and perform, above and beyond all others, is the utilization of his talents to the maximum in the prevention of illness and the cure of disease.

Virgil M. Hancher, President,
State University of Iowa

Excerpts from *The Social Responsibilities of Medicine*, Journal of the Association of American Medical Colleges 25:81, 1950.

NARCOANALYSIS IN CRIMINAL INVESTIGATION

The medical profession may be getting itself into an unfortunate situation in connection with its participation in the method of narcoanalysis in the interrogation of persons suspected of crime. At present the practice is said to be done only when the suspect volunteers. It is, however, a rather unpleasant experience and the scientific validity of its results is certainly far from being adequately established. Furthermore, tomorrow it may be proposed for unwilling subjects, much as it is said to have been employed in certain other countries. And it is to be remembered that "compulsory" and "voluntary" are relative terms without absolute significance in the case of incarcerated suspects of major crime.

Physicians cannot escape from participation in the determination of guilt or innocence in certain types of criminal proceedings. The use of methods to disintegrate a human personality by chemical means and thereby attempt to glean information which the criminal suspect would not otherwise give is, however, a departure which may ultimately put at least a certain class of physicians in an activity of questionable ethical character. Perhaps it is legitimate to use the boon of anesthetic agents in criminology. Perhaps it is ethical for a physician to employ his skills in criminal narcoanalysis. Or perhaps it is a perversion of the use of the former and of the high calling of the latter.

Legal standards are, or should be, based on ethical standards. Ethical standards are set by society, and in the case of medical practice depend largely upon the attitudes of physicians. The medical profession should give serious consideration to this problem, if for no other reason than to outline conditions under which the practice of non-medical narcoanalysis can be considered proper, if it can indeed be. One should not fail to note that there have been quite a number of reports of criminal trials in certain other countries in which the use of certain unspecified "drugs" has been said to have played a role in the outcome. Perhaps some of the principals had also been narcoanalyzed. Perhaps the ethics of chemical poisoning of the brain is not far different from the ethics of beating the man's body until he also gives up certain information. Beating up brain cells by chemical action without medical indication may be just a more refined kind of impropriety. It is not suggested that narcoanalysis may not be a useful research, diagnostic or therapeutic tool. M. B. V.

News Briefs

North Dakota

Installation of Dr. L. W. Larson as president, and Dr. W. E. G. Lancaster of Fargo as president elect and a number of scientific lectures on May 30 closed the 63rd annual meeting at Grand Forks of the North Dakota State Medical association.

The four day convention drew a large percentage of members of the association and offered an outstanding scientific program.

In his closing address as president of the association, Dr. W. A. Wright of Williston pleaded for professional freedom away from governmental control. The incoming president, Dr. Larson, devoted his inaugural address largely to organization matters.

Dr. Joseph Sorkness of Jamestown was elected second vice president of the group; Dr. O. W. Johnson of Rugby, first vice president; Dr. A. E. Spear, Dickinson, speaker of the house; Dr. G. A. Dodds, Fargo, vice speaker of the house; Dr. O. H. Sedlak, Fargo, secretary; Dr. E. J. Larson, Jamestown, treasurer; Dr. W. A. Wright, Dickinson, delegate to the American Medical association, and Dr. G. W. Toomey, Devils Lake, alternate delegate to A.M.A.

New councillors are Dr. J. F. Hannah, Fargo; Dr. C. J. Glaspel, Grafton; Dr. R. H. Waldschmidt, Bismarck; Dr. R. D. Nierling, Jamestown.

The transactions and full account of the meeting will appear in the September issue of Journal-Lancet.

* * *

Members of the medical and advisory council of the North Dakota state medical center held their semiannual meeting on June 20 in the medical school building at the University of North Dakota in Grand Forks.

The program called for a discussion of plans for expansion of the medical school and of the problems of interns and internships and the college nurses program at the University.

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Dr. W. A. Wright of Williston was recently reappointed to a three year term on the North Dakota state health council by Governor Fred G. Aandahl.

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Dr. P. J. Weyrens of Hebron observed in June the fiftieth anniversary of his entrance into the practice of medicine. He has been at Hebron over twenty years and is still serving that community as family doctor.

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Joint memorial and dedication services for the new $125,000 Richardton Memorial hospital were held on Tuesday, May 30. Chief speaker at the ceremonies was Judge Gunmunder Grimson of the Supreme court. The hospital will be operated by the Benedictine Sisters from the St. Alexis hospital at Bismarck.

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Dr. S. W. Chiasson and Dr. R. A. Lewis of the Vanguard clinic at Vanguard, Alberta, will open a clinic in Richardton. Both doctors are Canadian born and are graduates of McGill university in Montreal.

Dr. A. K. Saiki of the University medical school has been certified by the American Board of Pathology in the fields of pathological anatomy and clinical pathology.

A native of Hawaii and a graduate of the University of Nebraska, Dr. Saiki has been at the University since 1928.

* * *

Dr. Robert B. Tudor of the Quain and Ramstad clinic, Bismarck, has been made a diplomate of the American Board of Pediatrics.

* * *

New locations . . .

Dr. Daniel L. Bray has left Bottineau, North Dakota, for Algona, Iowa, to take over the practice of a former classmate.

* * *

Dr. Louis S. Gerber, who has practiced in Lakota for six years left in June for Albuquerque, New Mexico, where he will serve as assistant director of the student health service and hospital at the University of New Mexico.

* * *

Dr. Mark P. Graeber, formerly associated with the hospital at Eureka, South Dakota, has opened a medical practice in Wishek.

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Dr. Robert R. Giebink, a specialist in orthopedic surgery, has joined the staff of Fargo veterans hospital.

* * *

Dr. Michael F. Koszalka, a specialist in internal medicine and a graduate of Georgetown university, has joined the staff of Fargo Veterans hospital.

Minnesota

Dr. J. F. Norman, Crookston, is president-elect of the Minnesota State Medical association to succeed Dr. F. J. Elias, Duluth, in 1951. He was elected at the 97th annual convention of the state group in Duluth June 12 and 13.

Delegates at the business session elected Dr. Elias and Dr. J. A. Bargen, Rochester, as delegates to the American Medical association convention. Dr. Willard White, Minneapolis, was elected first vice president, and Dr. A. E. Brown, Rochester, second vice president. Dr. B. S. Scouster, St. Paul, was re-elected secretary and Dr. W. R. Condit, Rochester, was re-elected treasurer.

* * *

Dr. George E. Fahr was honored by his former students and associates June 14 at a dinner in the Campus club of Coffman Memorial Union at University of Minnesota. Dr. Fahr, 68, is retiring after 29 years during which he has taught internal medicine at the university and served as chief of the medical service department, Minneapolis General hospital and chief of the university heart clinic. A sum of more than $8,000 was presented in his name to the Minnesota Medical Foundation.

A UNIQUE DEVICE for teaching use of x-ray equipment will be shown in London in late July by Dr. Linneus Idstrom, associate director of radiology at Swedish hospital, Minneapolis. Dr. Idstrom will demonstrate the instrument at the International Congress of Radiology which meets July 23 to 30.

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THE COLVIN MEMORIAL SURGICAL FUND, to carry on a research and teaching program, has been established at Ancker hospital. The fund is in memory of Dr. Alexander R. Colvin, for more than 30 years chief of staff at the hospital.

* * *

OPENING of the new $300,000 Swift County-Benson hospital took place at Benson Sunday afternoon, June 18. Dr. Walter Kvale, consultant in the division of medicine at the Mayo clinic, Rochester, and native of Benson, gave the main address at the hospital.

* * *

Development of a program of specialized pediatrics care for the nearly 1,500 children in two Minnesota state hospitals, a pioneer venture in America, was announced recently. The plan, first of its kind in America, was conceived and developed by Dr. Ralph Rossen, state mental health commissioner, and Dr. John Adams, who has resigned as assistant professor of pediatrics at the University of Minnesota to become director of the pediatrics department and professor of pediatrics at the University of California at Los Angeles.

The pediatric specialists' program is one phase of a series of cooperative undertakings between the state mental health division and the University of Minnesota in the new mental health program.

Deaths

DR. DUMA ARNOLD, 58, Minneapolis physician, died June 12 in Philadelphia. Dr. Arnold received his M.D. in 1920 and practiced in Roebling, N. J., before coming to Minneapolis. He was a member of the staffs of Asbury and Maternity hospitals and clinical instructor in obstetrics and gynecology at the University of Minnesota.

* * *

DR. KARL DEDOLPH, practicing physician and surgeon since 1912, died June 8 in St. Paul. He was a member of the Ramsey County Medical society, A.M.A., and Alpha Kappa Kappa medical fraternity.

* * *

DR. A. E. CARDLE, Minneapolis specialist in internal medicine, was killed on June 23 in an airplane crash in Lake Michigan. Dr. Cardle, a graduate of the University of Iowa in 1923, was a member of the staffs of Abbott, Northwestern and General Hospitals.

Dr. Cardle had been at a meeting in Montreal, Canada and was to have been joined by Mrs. Cardle for a flight to San Francisco, where he was to have attended an American Medical association meeting.

* * *

DR. CLEMENT PAUL GILLESPIE died May 29 in Portland, Oregon. He was graduated in 1948 from the Creighton University school of medicine at Omaha, and was taking his internship at St. Vincent's hospital in Portland.

* * *

DR. JOHN J. RATCLIFFE, 78, died May 24 in Northern Pacific hospital in St. Paul. He was taken ill on his way home from Brownsville, Texas.

* * *

DR. JOHN P. SCHNEIDER, 71, retired Minneapolis physician, died June 15. A co-founder of the Nicollet clinic in 1920, he retired in 1929. He was born in Lewiston, Minnesota, attended Winona State Teachers college and the University of Minnesota, where he received his M.D. degree in 1906.

* * *

DR. V. H. MOATS, 77, resident of McClusky since 1931, died May 3 in Fargo. He was graduated from Hamline University medical school in 1908 and was associated with Dr. Hagen at Williston. He served in the army medical corps from 1917 to 1920.

* * *

DR. F. D. WILSON of Sioux City, South Dakota, died May 14. He had practiced in Corsica for two years, in Armour for about ten years, and in Winner for several years before coming to Sioux City six years ago.

* * *

DR. KENNETH G. WILSON, 34, died June 19 at Laguna Beach. A graduate of University of Minnesota, Dr. Wilson was a member of Psi Upsilon and Nu Sigma Nu fraternities.

AMERICAN COLLEGE HEALTH ASSN. NEWS

(Continued from page 268)

Health insurance for college students was presented by several speakers. Dr. Frank O. Robertson, University of Denver, discussed his experience with student health insurance covered by a private insurance company. After a year of trial, the University and the insurance company are satisfied with the system. Dr. Thomas H. Rawles, treasurer of Colorado College, pointed out the wide range in annual expenditures at different institutions and asked for consideration of methods of insurance to permit wider health coverage at reasonable cost. Mr. John Vance, representative of the Colorado Medical Service, discussed the possibility of prepayment of hospital and surgical care for college students through the Blue Cross system.

Dr. Richard H. Mellen, orthopedic surgeon of Colorado Springs, presented the subject, "The Treatment of Knee Injuries in the College Infirmary," with a plea for proper management from the start in order to cut down the incidence of later weak knees, re-injuries, and "trick knees." During the final hour of the meeting an informal general discussion was held covering a variety of topics pertinent to college health service.

Two local sections have already made plans for the annual conference in the fall. The Southwestern Section has scheduled an annual meeting in Austin, Texas,

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AMERICAN COLLEGE HEALTH ASSN. NEWS

(Continued from page 277)

on November twenty-ninth and thirtieth. Two special attractions for the delegates include a tour of the new University of Texas Health Center and the colorful and famous University of Texas and Texas A & M College football game on the afternoon of the thirtieth. The officers of the section are: president, Caroline Crowell, M.D., the University of Texas and secretary, Hiawatha Crosslin, Ed.D., S.W. Texas State Teachers College.

The program promises a stimulating and interesting meeting. On the program are the following topics: "Health and Student Housing," "Problems of Adjustment in Physical and Mental Health of College Students," "Highlights of the First International Health Congress for College Women Held in Denmark," "Malignancies in the College Age Group," and "Problems of a Hospital-Centered University." Among the speakers are Thurman B. Rice, M.D., University of Indiana; George M. Decherd, Jr., M.D., the University of Texas; Eleanor J. McDonald, M.D., Anderson Cancer Hospital; Margaret Peck, M.A., the University of Texas; Hiawatha Crosslin, Ed.D.; and a panel of experts. Another feature on the program is a discussion by a panel of students on the subject, "What Can a University Health Service Mean to Students?".

The Executive Committee of the Pacific Coast Section has planned a meeting for November twenty-fourth and twenty-fifth to be held at the University of Oregon. The proposed program includes three main topics: health education, mental health, and four selected medical diseases common to college students.

The University of New Hampshire needs a physician for the position of Director of Health Service beginning in September. Write to Everett B. Sackett, Dean of Student Administration, for further information.

Meet Our Contributors

LAURENCE B. CHENOWETH has directed the Students' Health Service at the University of Cincinnati since 1922. A graduate of Johns Hopkins University, Dr. Chenoweth is a member of the Cincinnati Academy of Medicine, the Ohio State Medical Association and is a fellow of the A.M.A.

★

ABRAHAM COHEN is a graduate of Jefferson Medical College, is chief of the arthritis clinic at Philadelphia General hospital. He is a member of the Philadelphia County Medical Society, A.M.A. International Society of Medical Hydrology, International League against Rheumatism and is a diplomate of internal medicine.

★

ALFRED G. DUBBS was graduated from the Jefferson Medical College, serves as chief of medicine, Sacred Heart Hospital, Allentown, Pennsylvania, and assistant physician, arthritis clinic of the Philadelphia General Hospital. He is a fellow of the A.M.A. and the American College of Physicians, a member of the scientific council of the American Heart Association, the American Diabetic Association, the International Society of Medical Hydrology.

★

DEAN FLEMING was graduated from the University of Minnesota medical school in 1936, took graduate work at the Harvard School of Public Health, is now associated with the Minnesota Department of Health. He is a member of county and state medical societies, the Trudeau Society and the American Public Health Association.

★

JOEL GOLDMAN, a graduate of Jefferson Medical College, is assistant physician at the arthritis clinic at Philadelphia General hospital. He is a member of the International Society of Medical Hydrology, American Heart Association, American Diabetes Assn., American College of Chest Physicians, A.M.A.

★

ALTON C. GRORUD, a graduate of the University of Wisconsin medical school, is chief of internal medicine service at St. Alexius hospital in Bismarck, North Dakota. He is a member of district and state medical societies, A.M.A., Association for the Study of Internal Secretions, a diplomate of the American Board of Internal Medicine, F.A.C.P. and F.A.C.A.

★

GEORGE M. HART is a graduate of Northwestern University medical school, specializes in orthopedic surgery at Northwest Clinic in Minot, North Dakota.

EDITH M. LINDSAY is on the faculty of the school of public health of the University of California. A graduate of Stanford University, Dr. Lindsay is secretary-treasurer of the American College Health Association, consultant in health education of San Rafael Schools, advisor of the University of California student health council, and consultant in health education to the University College Health Service.

★

F. PHILIP LOWENFISH, a graduate of Syracuse University Medical School, is instructor of dermatology, Columbia University College of Physicians and Surgeons, serves on the staffs of Vanderbilt Clinic, New York City Hospital, and the Medical Arts Center Hospital. He is a diplomate of the American Board of Dermatology and a member of several medical societies.

★

THOMAS J. MCBRIDE, a graduate of Jefferson Medical College, is a resident in medicine at the Pennsylvania Hospital in Philadelphia, and is a member of Alpha Kappa Kappa.

★

HARVEY WILLIAM STONE is a graduate of the University of Minnesota medical school, specializes in radiology at the university after three years of graduate training. He is a member of Alpha Omega Alpha.

★

HALVOR VERMUND was graduated from the medical school of the University of Oslo in Norway, is a member of the radiology department of the University of Minnesota. He is a member of the Norwegian Cancer Association.

★

MAURICE B. VISSCHER, a graduate of the University of Minnesota medical school, is past president of the American Physiological Society, is secretary of the Minnesota Medical Foundation, chairman of the Minneapolis Poliomyelitis Research Commission, was chairman of two medical missions to Europe in 1945 and 1947. Dr. Visscher is head of the physiology department at the University of Minnesota.

★

ELEANOR ROVERUD IZQUIERDO, whose article with Dr. O. E. Engstrand, The Coexistence of Diabetes Mellitus and Diabetes Insipidus, appeared in the June issue of JOURNAL-LANCET, is a graduate of the Woman's Medical College, studied at the University of Minnesota medical school for one year, is now continuing her graduate study in pathology at the school of Tropical Medicine, San Juan in Puerto Rico.

The JOURNAL LANCET

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PREPARATION OF MANUSCRIPTS

JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

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The JOURNAL LANCET

Minneapolis, Minnesota
August, 1950

Vol. LXX, No. 8
New Series

The Neurosurgical Treatment of Intractable Pain

A. Earl Walker, M.D.*

Baltimore, Maryland

Until the first part of this century it was not clearly recognized that pain was of two types—one a sensation like our other senses and the other a feeling tone akin to our emotions. The sensation—pain—has a constant threshold in the same individual at different times and also in different individuals. The feeling tone or reaction to pain on the other hand has a great variation in threshold in the same patient at different times and in different patients. Pain perception is dependent upon simple neuronal pathways, but pain reaction is the response of complex integrative neuronal mechanisms.

A vicarious reaction to pain may be readily induced by conditioning. In young children accurate audiometer tests may be made by using an audible tone, followed by a painful stimulus and recording the change in skin resistance, one of the somatic manifestations of the reaction to pain. After a very few trials, the painful stimulus may be omitted and the change in skin resistance occurs whenever a tone is heard. By this means without the verbal cooperation of the patient an audiogram may be determined. This conditioning process may occur in disease states so that even when the pain is eliminated the patient may still suffer. A letter from a patient whose trigeminal root I had cut for tic douloureux is pertinent.

"Your operation (for trigeminal neuralgia) was successful as far as the pain was concerned, but the fear of pain caused me to become a highly nervous, fearful person. When I eat or think of eating my head seems to become tight and my ears stop up. I can be eating like I was starved to death and a little voice in my head seems to say 'you cannot eat' and I choke up."

The actual pain must, then, be dissociated clearly from the general emotional reaction of the patient—his suffering, his remorse, and even his humiliation. It is well known that no two patients react identically to the same pathological condition. Some minimize their symptoms, some exaggerate them. Their reaction depends upon a number of factors—the personality make-up, the physical, mental and social state of the patient and other less tangible factors. Thus a football player in good health, who finds his sport interesting and exciting, will sustain an injury and continue the game in spite of pain. But a player who feels his sport too strenuous and difficult, but who must keep at it for his personal prestige, may be out of the game for the season when sustaining a minor but obvious injury. The injury provides him with an adequate excuse for dropping the game which threatens the integrity of his ego.

This same principle is applicable to the more serious diseases of mankind. When pain has ceased to be a factor acting upon the personality and becomes incorporated into the personality of the individual any therapeutic procedure is doomed to failure so long as the elements which incorporated the pain in the personality remain. And in many instances it is difficult if not impossible to eliminate these fundamental factors. Not long ago a patient consulted the author for pain in his amputation stump. It was evident after a brief survey that he was a timid dependent man who had always felt inadequate—in his work, in society and even in his family.

---

*From the Division of Neurological Surgery, The Johns Hopkins University School of Medicine, Baltimore, Maryland.

Here is the report of the psychiatrist, Dr. Harold Rosen:

"He told me that his pain subsided within a few months of his amputation in 1923 but recurred with considerable severity in 1932, at the time of the death of his father. For several weeks after his father's death, he would see his father's image at night. His father would appear to be in severe agony and then this agony would be transmitted to the patient. Soon thereafter the phantom pain recurred.

"The pain again became worse after a series of illnesses which necessitated his giving up support of the family and watching his wife assume this role. He described marked dependence upon his wife (whom he calls mother), but his inferences made it clear that his feelings for her were quite ambivalent. . . . This patient wants a dependency relationship which he cannot consciously accept . . . If this pain should be removed, either by direct suggestion under hypnosis or by cordotomy it would be necessary first of all to treat and remove those factors which emotionally make it possible for symptoms to fulfill the functions which they do. Otherwise, the pain will either recur, another symptom may take its place (and this other symptom most probably would be a more disabling and incapacitating one), or—and this is the most likely possibility—a suicidal depression will supervene. As a result, cordotomy is psychiatrically contra-indicated at this time."

Let me illustrate this point by a converse situation. During the past World War thousands of soldiers of this and other countries had amputations. The actual surgical techniques did not differ a great deal in the various countries. In France, however, between six and 12 per cent of amputees have required some form of neurosurgical treatment for painful amputations and phantom limbs. In this country, practically none needed such treatment. In fact, in an Army General Hospital, an amputation center, in 1947 only five patients from over 400 amputees could be found who had any complaint, even a mild paresthesias, referable to the stump. Why was there this great difference? An analysis of pre- and post-operative care afforded these cases offers the solution. In France the patient had his limb off and was sent home within a few weeks without a prothesis. Often his home was in ruins, his family scattered, perhaps several members dead. He had no means of earning a livelihood and no hope of rehabilitation. Small wonder that his stump, upon which he blamed his misfortune, became painful and a phantom limb appeared to plague him.

But consider the amputee in this country. Counselled by psychiatrist and rehabilitation officer, the latter often an amputee himself, he was shown what might be accomplished with a prothesis. As soon as his stump was suitably healed, one was provided and he was instructed in its use. The prettiest nurses in the hospital accompanied this man to picnics, shows and dances. As soon as the amputee had become dextrous with his prothesis he was advised regarding vocational training and started on a course which would fit him for the position or job he wanted.

By the time these men left the hospital they had made an adequate psychological adjustment to their disability, had acquired a vocation and regained their faith and hope in life. The psychological, economic and social factors which precipitate phantom limb symptoms were absent, and the pain was equally absent.

NEUROSURGICAL TREATMENT OF PAIN

These factors are often neglected until a perfectly good operation has failed to relieve the pain. Only then is it thought that the discomfort may be not so much an accompaniment of the somatic disease as a personality maladjustment to the disorder.

However, many patients with normal personalities develop disease having agonizing pain. Although the logical treatment of such cases is removal of the cause, in many instances that is impossible. Narcotics and analgesics may help temporarily but some more permanent relief is often desirable.

Sympathectomy. Sympathectomy has a definite role in the relief of pain. The treatment of causalgia is now recognized to be sympathectomy of the involved part. The results of this procedure have been uniformly good, in some series 100 per cent of cases being markedly improved.[15] Preliminary chemical blocking by procaine of the sympathetic rami and ganglia is a valuable diagnostic and prognostic test. Repeated blocks occasionally will give permanent relief. If the procaine injection does produce a marked or complete relief of pain, good results may be expected from sympathectomy.

For causalgia of the upper extremity a preganglionic interruption of the thoracic chain below the third ganglia with section of the rami communicantes of the 2nd and 3rd ganglia (Smithwick procedure) usually gives good results. Removal of the 2nd or 3rd lumbar ganglia is adequate to relieve most cases of causalgia of the lower extremity, but in some cases the site of injury may have to be denervated for relief.

Both experimental and clinical experience suggest that resection of the 2nd, 3rd and 4th thoracic sympathetic ganglia should relieve anginal pain. Lindgren and Olivecrona[9] report that the best results are obtained by uni- or bi-lateral resection of the stellate and upper four thoracic ganglia, complete relief being obtained in 43.7 per cent of cases and partial in 40.8 per cent. Myocardial infarction, the cause of death in most cases, caused little or no pain.

Abdominal pain may be relieved by resection of the celiac and superior mesenteric ganglia. Presacral neurectomy is valuable in the relief of pain associated with dysmenorrhea, endometriosis, inoperable carcinoma of the genitalia and in the treatment of pelvic pain of unknown etiology. Presacral neurectomy for dysmenorrhea gave good results in 50 per cent and some improvement in 29 per cent in a series of 68 cases reported by Phaneuf.[10]

Gardner et al,[2] acting on the hypothesis that some headaches may be due to parasympathetic discharges passing over the facial nerve, resected the greater superficial petrosal nerve in 26 patients suffering from unilateral facial pain. A temporary facial paralysis complicated the convalescence in seven of the 31 operations. In 13 cases of histamine headache (paroxysmal unilateral head pains, usually retro-orbital or temporal, accompanied by profuse lacrimation and nasal discharge) the results were classified as excellent in approximately 25 per cent of the cases, as fair in 50 per cent, and as failures in 25 per cent. In nine cases of migraine, the results were somewhat better.

Rhizotomy. The best known and most satisfactory rhizotomy is the classic retrogasserian neurectomy for trigeminal neuralgia which is a simple operation, well tolerated even by the aged. The price for the relief of pain is anesthesia of the previously involved portion of the face. This sensory loss is usually not unbearable, but occasionally paresthesias are quite annoying. Fortunately, this complication occurs in less than 5 per cent of cases. Keratitis is rarely seen, now that a subtotal avulsion of the root has become standard practice. Facial paralysis, occurring in about 6 per cent of patients, usually is temporary and, unless the cornea has been denervated, not a serious complication. Pain from malignancies of the head may also be relieved by trigeminal neurectomy but often some recurrence of pain detracts from the result.[3]

Section of spinal posterior roots for the relief of pain has not proved to be generally satisfactory, due to a failure to relieve the pain and distressing paresthesias in the denervated areas. To be sure of complete denervation of a given dermatome at least two and sometimes three roots above and below the dermatome must be sectioned. This produces a large anesthetic zone which is often paresthetic. The resulting numbness is at times complained of more than the pain. If the upper extremity is so denervated the limb becomes useless and so annoying to the patient that an amputation is often sought.

Section of the pain carrying fibers—the spino-thalamic tract—leaves intact touch so that numbness is not present. This procedure may be carried out in the spinal cord (chordotomy), medulla oblongata (medullary tractotomy), mesencephalon (mesencephalic tractotomy) or thalamus (thalamotomy).

Chordotomy. Anterolateral chordotomy is a standard and excellent procedure for the relief of pain, although because of technical operative difficulties the results are not always as good as desired. The most common causes of failure are (1) improper position of the incision, either too far anterior to the dentate ligament in cases of pelvic pain or failure to carry the incision far enough anteriorly in thoracic pain, (2) improper selection of cases, (3) failure to make a bilateral chordotomy for abdominal malignancy with unilateral pain and (4) too great a delay in performing the operation.[6] Unless a patient has a life expectancy of at least six months, he or she will not live long enough to recover from the discomfort of the operation and the annoyance of the urinary incontinence which commonly is a complication. A progressive cachexia added to these distressing factors may make life unbearable even though the pain has been eliminated.

Medullary tractotomy. Relief of pain in the upper chest and shoulder may be accomplished by section of the spino-thalamic tract in the medulla oblongata. The operation must be considered a hazardous procedure in debilitated patients.[1] Although cerebellar disturbances may not be apparent while the patient is in bed, when ambulation is attempted a severe ataxia may appear and be present for a period of several months postoperatively.

Mesencephalic tractotomy. Interruption of the pain tracts from the entire opposite half of the body may be accomplished by a section of the lateral lemniscus at the level of the mesencephalon.[14] Such an operation is somewhat more complicated than a spinal chordotomy but can be accomplished with a mortality of approximately 7 per cent. A complete analgesia of the opposite side of the body results. In 10 per cent of cases a burning paresthesia may complicate the result. Since the operative incision is well removed from the motor tracts no motor or urinary disturbance follows: The procedure cannot be done bilaterally without producing complete deafness. In a personal series of 13 cases (14 operations) the results were considered good in six cases, fair in three cases and poor in one. Two patients could not be traced for a follow-up. One patient died postoperatvely.

Thalamotomy. By means of a stereoencephalotome electrolytic lesions may be placed in the long ascending pain-conducting pathways in the midbrain. The procedure has not been studied sufficiently to evaluate its place in the treatment of pain.[13]

Trigeminal tractotomy. To prevent the distressing paresthesias which sometimes follow a retrogasserian neurectomy Sjöqvist[12] introduced section of the descending root of the trigeminal nerve. This procedure has a definite place in the treatment of intractable facial pain, but it has a somewhat higher mortality than the classical retrogasserian neurotomy. Unfortunately the results of section are less certain than those of the neurotomy and not uncomplicated by paresthesias.

Cortical resection. In 1942 de Gutierrez-Mahoney[4] suggested that removal of the postcentral convolution representation of a phantom limb might relieve associated pain. However, in a recent review he has stated that with rare exceptions the pain returns within a few months.[5] The reason may be found in the extensive and diffuse cortical representation of the arm and leg in the cerebral cortex.

Prefrontal lobotomy. Considerable emphasis has been placed in the past two years upon the value of bilateral prefrontal lobotomy in the treatment of intractable pain. If suffering is prominent the distress may be eliminated temporarily or permanently by prefrontal lobotomy. The patient still appreciates painful stimuli and, in fact, may react by motor withdrawal to lesser stimuli than before lobotomy. No longer does the patient complain spontaneously of his discomfort. In approximately one third of the cases these excellent results are uncomplicated by lasting mental confusion or objectionable personality change. In approximately 20 per cent of cases the patient is so confused mentally and has such pronounced apathy that he has no interest in his environment. He remains vegetating between life and death. Occasionally the patient, following the prefrontal lobotomy, becomes frankly psychotic with severe mental confusion, hallucinations and delusions. Another one third of the cases are not relieved of their pain or are improved only temporarily. Some of these failures are more difficult to care for after lobotomy on account of their mental confusion. To avoid these unpleasant sequelae two modifications of the procedure have been advocated—topectomy and unilateral prefrontal lobotomy.

Topectomy[8] has not been used extensively enough to know its real value and limitations. Unilateral prefrontal lobotomy, ipsilateral or contralateral to the pain, introduced by Koskoff,[7] has been found to give relief from pain in 25 to 35 per cent of cases. Scarff[11] claims that two-thirds of his patients were markedly improved or free of pain without intellectual impoverishment or mental derangement, but most neurosurgeons admit that their results are much less favorable on both scores. In individuals over 50 years of age at least a temporary mental confusion is the rule, and not infrequently a more permanent mental impairment. Moreover, after three to four months 75 per cent of the patients are complaining as severely of pain as before operation. However, if the unilateral is now converted into a bilateral prefrontal lobotomy, the pain may be relieved, often with less mental confusion than follows a simultaneous bilateral prefrontal lobotomy done in one stage. But failures are not uncommon even with this technique.

Discussion

The relief of intractable pain remains a serious problem. The recognition of the role of the personality in pain makes it easier to understand the failure of surgical treatment but does not aid much in the relief of the distress. The place and limitations of prefrontal lobotomy are not too clearly defined but it is evident that the first reports of this procedure were prematurely enthusiastic. With this realization, the oft-repeated but apparently infrequently followed advice that prefrontal lobotomy should be used as a last resort deserves more serious consideration especially in patients with an indefinite life expectancy.

What course, then, should be followed in the treatment of intractable pain? In certain syndromes, specific techniques are indicated such as the retrogasserian neurectomy for trigeminal neuralgia, and sympathectomy for causalgia. In the more general pain syndromes, however, specific measures are not available. If the life expectancy is short, not more than three to four months, analgesics and narcotics are preferable to any surgical procedure on the central nervous system. An exception to this statement might be taken in the case of a patient who does not need or desire a clear mental state in the terminal period. In such a case a prefrontal lobotomy might well relieve the suffering and eliminate the necessity of constant narcotics. If the expected life is six months or more an appropriate section of the spinothalamic tract offers the best chance of complete relief with fewest untoward sequelae. Should the patient present psychoneurotic trends complicating pain, a prefrontal lobotomy may relieve both conditions. When a satisfactory chordotomy has not been effectual, a unilateral prefrontal lobotomy seems indicated and may give a good result. The second side may be done as a last resort.

It is then apparent that the relief of intractable pain requires a nicety of judgment on the part of the physician who must weigh medical, economic and social factors in formulating the best therapy.

Summary

Pain is of two types—one a sensation and the other a feeling tone akin to the emotions. The former has a constant threshold but the latter, being a reaction to pain, is quite variable. In treating pain these two varieties must be differentiated.

Appropriate sympathectomy may relieve causalgia and certain thoracic and abdominal pains.

Rhizotomy is effective in the treatment of facial pain but of little value in the therapy of pain elsewhere in the body. For such pains, interruption of the spinathalamic tracts at the spinal, medullary or mesencephalic levels is the therapy of choice.

Prefrontal lobotomy may be of value in selected cases but its beneficial effects are often negated by undesirable mental disturbances especially in elderly patients.

The therapy of pain demands an evaluation of medical, economic and social factors.

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Narco-Analysis for Criminal Interrogation

A Preliminary Report

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The Division of Anesthesiology of the University of Minnesota Medical School presents here a *preliminary report* of our experience with narco-analysis for criminal interrogation, or the so-called "truth serum" tests. The report is based on ten examinations conducted during the past 19 months. From this small number of cases, we have gained an insight into the vast fields of psychiatry and criminology and have discovered the acute need for research development of an anesthetic agent and technique which will enable these two forces to accomplish their purpose. This is a "new" search only in the sense that it is made by anesthesiologists and not by psychiatrists or criminologists.

Our attention was directed to the problem on September 28, 1948, when the Department of Protection and Investigation of the University requested the first examination of this type in the history of the two departments. Since that time ten cases have slowly accumulated. Our interest and investigation into the problem has been as slowly provoked. Now that our lethargy is shaken, we are earnestly trying to evaluate our experiences and estimate the possibilities for research from the point of view of the anesthesiologist.

Historical Development

The narco-analytic technique was introduced to psychiatry by Bleckwenn in 1929 when he reported the use of sodium amytal for the psycho-analysis of patients he could not hypnotize. Since that time narco-analysis has acquired a respected place in the practice of psychiatry. In 1932 Lorenz suggested that narco-analysis could be used for criminal interrogation. At the same time House reported the use of scopolamine for certain police investigations. The interest in these suggestions and reports did not become evident in the medical literature until the war years.

The principal investigators of "truth serums" have been psychiatrists and criminologists. They report the use of ether, nitrous oxide, scopolamine, pentothal, amytal, nembutal, sonoryl, narcomunal, evipan, and somnoform for ordinary narco-analysis. Apparently their criminal interrogations have been conducted only with pentothal, amytal, or scopolamine narcosis. They have not agreed on the choice of drugs for either purpose.

Regardless of the drug or technique used, they have secured only 50 per cent success in the detection of deception which can later be substantiated by facts.

The most popular technique (using pentothal or amytal) required the slow induction of the subject to the surgical plane of anesthesia. Thereafter he was allowed to regain the senses of hearing and speech. Questioning began and was continued until the patient evidenced enough control of thought-mechanisms to evade or guard his answers. This period lasted for five to ten minutes, after which the process was repeated, again and again. The average length of the examination was reported between one and two hours. Their recorded incidence of complication for all types of narco-analysis is one in 3,000 cases. No statistics were available on the incidence of complication in narco-analysis for criminal interrogations.

Theory

A number of explanations have been offered for the production of confessions under narcotic drugs.

The natural caution of a criminal urges him to seek seclusion and avoid all future connections with the crime he may have committed, but his desire to claim credit for the acts, plus a potent wish-for-punishment may cause him to neglect his safety and perform acts that may inevitably lead to his capture. Aside from the desire to achieve self-aggrandizement, recognition, and the wish-for-punishment, confessions may follow when fears attendant upon their declaration are reduced. Fears of retaliation, social stigma, pecuniary loss and punishment are better met by the reinforced ego which may make a realistic compromise with the community, balancing the precarious safety of the secret against the squaring of accounts with the social environment.

Kubie, Grinker, Freed, and Barbara have commented on this phenomenon, suggesting that narcosis promotes removal of tension, anxiety, and defense barriers and helps the reintegration of the ego functions. Narcosis may diminish caution and restrict the desire for self-preservation. Judicious behavior becomes impossible, and consciously motivated activity is substituted by fundamental physiologic drives. In this state the demand of an intolerant conscience for atonement may dominate the content and direction of the catharsis.

Lorenz implies that the ideal state for eliciting a confession is that where the individual is "oriented but unable to inhibit automatic responses to stimuli."

It was suggested by House that the patient under scopolamine " . . . cannot create a lie and that there is no power to think or reason."

De River states that you cannot confuse the truthful man because he cannot remember what he said under the influence of the drug. Further, he asserts that "no man can tell a lie, no matter how many times he repeats the story, without thinking the truth at the same time." He stresses this basic principle: "the only function of the center of hearing is to evoke memory. With the abolition of will power and the ability to reason removed, the tongue will automatically articulate any impulse memory sends to it. If too many questions are asked, the brain becomes tired, and the wrong answers will be obtained."

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Patients who have a strong desire to confess, but who for either emotional or political reasons cannot bring themselves to it may even on a conscious level welcome narcosis as an excuse to inform. Into this category fall men who fear to violate the "criminal's code" against squealers even when it is to their interest to do so. Other patients, who placed themselves in difficult situations by malingering amnesia, used the analytic sessions as a device to "recover" their memory without loss of "face".

ETHICAL AND FORENSIC PROBLEMS INVOLVED

The fact that the doctor can extract relevant information from his patient which might be useful to the prosecution of a criminal act imposes an obligation on the medical profession to use it wisely. The duty of the physician to protect his community against the depredations of criminals is sometimes at odds with his oath to keep his patient's secrets.

The law arbitrarily states that certain secrets cannot be withheld by the doctor without his risking criminal prosecution. For example, in 1926 the New York State Legislature enacted a statute requiring physicians to report to the police all wounds from firearms, powder burns, etc. Stryker describes the finding of the court in the cases of Peo. v. Sliney, 137 N.Y. 570; and Peo. v. Hock, 150 N.Y. 291, where it has been determined that a physician who examines a patient at the request of the district attorney for the purpose of giving information as to the prisoner's sanity, was competent to testify to any information gained as a result of that examination, as "the relationship of physician and patient was not there."

It has been definitely established that the statutes protecting the patient by the recognition of the concept of the privileged communication "cannot be used to shield a murderer or other criminal." A Court of Appeals adequately summarized the limitation of this doctrine by stating the statute was " . . . to enable a patient to make known his condition to his physician without danger of any disclosures by him which would annoy the feelings, damage the character, or impair the standing of the patient while living, or disgrace his memory when dead."

From the point of view of the lawmakers, the duty of the doctor is clear. When he is aware of a criminal act committed by a patient, it is expected that he will inform the authorities concerning the crime.

Although an individual who is queried by an alienist for the states attorney may not be said to enjoy the patient-doctor relationship, he is still protected by the constitution of the United States. Article V of the Bill of Rights states that "No person . . . shall be compelled in any criminal case to be a witness against himself . . . "

The alienist must, therefore, decline to preform narco-analysis on a patient who does not relinquish his rights or understand that anything the interrogation may reveal may very well be brought up in court and charged against him. Yet the doctor performing narco-analysis has at his service a procedure which is kinder and more humane than so-called "third-degree" methods.

APPLICATION AND UTILITY

Should the patient sign a release, narco-analysis might be useful to the courts. We suggest the following instances:

1. *Where an individual is guilty of crime and believes he can conceal his guilt even if subjected to "truth serum"*: His motive for submitting to the test might be to strengthen his defense in court. He might, by the terms of his agreement, be able to call the doctor who conducted the analysis as a defense witness, and bring up the transcript indicating his "innocence" in open court. On the other hand, refusal to submit to narco-analysis might be mentioned by the prosecution in an effort to undermine his defense and prejudice the jury against him. This tactic might be used in forcing the patient to submit in the hope that he could avoid incriminating himself. Ludwig's experience with malingerers bears out the possibility that he might be successful in refraining from answering by a complete negativistic attitude. De River substantiates this with the statement that a subject who has been administered drugs to a sufficient amount and who continued to fight the effects of the drugs, demonstrates his guilt. However, it is probable that he would only succeed in trapping himself if he tried to maintain an alibi with the assumption that he would be able to use his wits and reasoning power to ward off incriminating questions while drugged.

2. *The suspect who is innocent:* A man who has difficulty in establishing his innocence would make a strong mark in his own defense by submitting to lie detection or narco-analysis. His attitude while under the influence of the drug would indicate whether his cooperation was simulated or real, entirely apart from the actual transcript and answers to questions. The material developed during his analysis could probably be substantiated by facts sufficient to effect his release.

3. *The suspect who has lost his memory for the event and cannot say whether he is innocent or guilty*: An individual may become implicated in a criminal action while under the influence of drugs, liquor, or while suffering a genuine fugue state or amnestic attack. Under narcosis he might divulge facts which would indicate his unconscious retention of memories relative to the events in question, and these in turn could clear or incriminate him. Perhaps too often the police authorities decline to investigate the validity of such assertions.

4. *The false avowers of guilt:* These are the publicity-conscious exhibitionists, the neurotic, morbid-minded individuals, the pranksters, and the prepsychotic individuals who always crop up after an infamous crime

and must be weeded out by the police at considerable expense and with difficulty. Narco-analysis might quickly determine not only their innocence but their basic motive in falsely confessing. The fact that they have signed releases would make it possible to prosecute them for obstructing the course of justice should this be necessary to discourage recurrence of such behavior.

5. *Establishing the innocence or complicity of associates and friends of the criminal or patient*: The implication of friends and accomplices is refused for fear that if he submitted to narco-analysis he might be able to give us the name of the actual thief and be absolved of being an informer. No less important is the testimony of a subject who absolves a friend suspected of being an accomplice or whose alibi can be substantiated.

The Department of Protection and Investigation

Not only was our study of narco-analysis for criminal interrogation inspired by the Department of Protection and Investigation, but its success and continuation is dependent upon their splendid cooperation. These examinations were conducted as a joint project; and any interpretation of facts garnered from this series is made with their tireless effort and whole-hearted participation in mind.

The requests for criminal interrogation by narco-analysis were initiated in the offices of the county attorney, or the states attorney when the crimes investigated occurred outside the borders of Minnesota. Because of the legal position of the Department of Protection and Investigation, the requests were routinely passed through the officials of the Minnesota State Bureau of Criminal Apprehension.

At the initial appointment, a brief of the entire case was presented by the authorities requesting the examination. This usually included all statements made by the subject, witnesses, investigating officers, criminologists, crime laboratory technicians, and any others having knowledge pertinent to the crime. Maps and drawings later served as an invaluable aid to the staff conducting the actual interrogation. Only after a thorough working knowledge of the crime had been assimilated was the subject interviewed by members of the Department. Their attitude toward the patient was of a friendly unbiased character designed to gain his confidence and cooperation. Caution was exercised to avoid antagonizing him, regardless of his attitude.

During the course of that interview, one or more examinations were conducted with the Keeler Polygraph, a lie detector apparatus which has been found 96 per cent accurate in over 500 cases investigated at this institution. (The Department is nationally recognized as one of the most reliable centers for the detection of deception with the Keeler Polygraph.) As a rule the results of the test were not discussed with the subject, although in every case the conclusions drawn from the lie detector examinations substantiated those later arrived at from narco-analysis.

When the circumstances permitted, the Department of Protection and Investigation secured psychiatric evaluation tests for the patients. Because we were unable to secure the tests in every patient of this series, we have declined to report their results. Perhaps more study will enable us to utilize these tests as an additional guide to the correct technique of interrogation for the individual patient.

The interview with the subject was concluded with a discussion of the written release and hospital operating room permit he was requested to sign at that time. Every precaution was taken to explain the possible consequences of his waiver of rights, and to specifically impress him with the fact that the transcription of the interrogation could be used for or against him in a court of law.

Ten patients studied by narco-analysis, according to the technique described below, gave us varying amounts of information which had been withheld from other investigators. Eight of the subjects were under arrest on suspicion of murder. Three of these were also suspected of or charged with sex offenses, and two other subjects were accused of armed robbery. The age of the patients ranged from 18 years to 72 years; there was only one woman in the group. The crimes under investigation were committed from four days to twenty-eight years prior to their admission here. All of the subjects steadfastly insisted they were completely innocent of the charges or offenses, or denied knowledge which could have been of help to the authorities.

Techniques and Observations

Prior to actual induction of the medication, the patients were interviewed by the anesthesiologist. The patient-doctor relationship was maintained and the fact that the patient was a prisoner, under police security, was quietly accepted but not stressed. It was established at the outset that everything the examination revealed was confidential, and that the audience to his interrogation would be limited to certain hospital personnel, the members of the Department of Protection and Investigation, and the police authorities who accompanied him. (Perhaps a second legal safeguard is contained in the fact that all those who participated in the examination, including the physician, were fully authorized police officials.)

Much of the suspicion against the doctor was lessened when his interest in the patient's "nervousness," "irritability," "tendency to get into trouble," and "bad breaks" was expressed and an investigation of medical problems was pursued. A history of his medical symptoms and systems was reviewed at this time. A brief and simple explanation of the action of the drugs, and the technique of their administration was made clear to the patient. It was emphasized that the drug would make him feel sleepy, and encourage him to discuss things with the doctor that might enable everyone to gain a better understanding of the case. Patients who had claimed to suffer amnesia were told that the drug would help restore their memory for the forgotten episodes.

The attitude was positive, forthright, but considerate. Seven patients obeyed without temporizing and accepted the doctor's explanation; three were suspicious and wary but offered no protests. Finally, a verbal confirmation of their written permission was obtained.

The patients were then led to a dressing room where they relieved themselves and exchanged their upper clothing for a scrub suit jacket. The examinations were all conducted in the operating room suite, with the patient comfortably reclining on the operating table. Care was taken to remove most of the usual operating room apparatus and reduce the apprehension caused by such an atmosphere as much as possible. (A search through the hospital failed to reveal a room satisfactorily equipped and conditioned for narco-analysis.) In compliance with previous promises made to every patient they were given a thorough physical examination, and it was possible to inform them that there was no contraindication to the administration of the anesthetic agents chosen for their case. A nurse was present in the room throughout the entire narco-analysis of the one woman interrogated.

We reasoned that adequate premedication would serve the same protective functions for narco-analysis as for general anesthesia, and it was used in the present series when there were no contraindications. Six of the patients were given oral premedication of seconal grs. 1½ one to two hours prior to induction. One patient was given intravenous premedication of seconal grs. ¾ fifteen minutes prior to induction. This change in the routine occurred when the intravenous form of seconal was recently introduced to the Division of Anesthesiology for the first time. The other three patients were unpremedicated. We are impressed with the fact that the amount of pentothal required to secure initial rapport in the subjects was reduced in those cases premedicated with seconal, particularly in the one case given intravenous seconal. We could ascribe no untoward reactions to the dose or route of administration of seconal in these cases.

The technique of administration of the three agents employed in this series, morphine, scopolamine, and sodium pentothal was varied with each case as we strove for proper rapport with the patient. Morphine and scopolamine alone were used in one interrogation; pentothal alone was used in a second case. Morphine, scopolamine, and pentothal were used in three examinations; and a combination of pentothal and scopolamine was used in five cases. It is our impression that the case in which the latter two combinations of drugs were employed (a) required much smaller doses of each drug, (b) were of shorter duration; and (c) demonstrated the most favorable levels of anesthesia for narco-analysis. Note at this point that these combinations are more closely similar to those employed for general anesthesia than morphine and scopolamine when used alone or in combination. The technique we have found most often successful will be described.

A vein on the forearm was selected for venipuncture with a No. 15 gauge needle, and a Gilson apparatus was attached and firmly taped in place. It was advisable to use a large gauge needle to avoid clotting of the smaller needle in the prolonged examinations. The Gilson apparatus enabled us to maneuver the patient and the syringe with freedom. At the time of venipuncture the level of sedation obtained from the premedication, the patient's age, weight, habitus, and degree of emotional unrest was evaluated to determine the correct dosage of intravenous morphine and scopolamine. This was found to vary through the entire series from morphine grs. 1/12th to grs. 1/4; and for scopolamine from grs. 1/300 grs. 1/100. The proportion between morphine and scopolamine was maintained in the ratio of 1:25. An interval of from five to fifteen minutes was consumed in evaluating the effect of these medications on the patient. A solution of 2½ per cent sodium pentothal in distilled water was available, and was then injected at the rate of 1 to 2 cc. per minute while the patient was engaged in constant conversation on totally irrelevant topics.

It was found necessary to bring the patient through the stages of light sleepiness, mild disorientation with a tendency toward euphoria, to confusion and somnolence, with irritability if roused by painful stimuli. The slow descent to this plane of the first stage in anesthesia required between 15 cc. and 25 cc. of pentothal, and was accomplished after 10 to 15 minutes in the robust patients. We found it unnecessary to allow the patients to recover gradually as recommended by many authors, but instead were able to stimulate the patient sufficiently to engage him in conversation immediately. The outstanding exception to this observation will be discussed later. With repeated stimulation and the judicious administration of from 1 to 4 cc. of pentothal at intervals varying from 5 to 30 minutes, the patient could be held in this stage while criminal interrogation proceeded. Almost uniformly the most incriminating statements were obtained at that level of anesthesia just before unconsciousness in which the patient required strong stimuli and loud, repeated questioning to affect the sense of hearing and speech. At that plane the speech was thick, mumbling, disconnected, and characterized by echolalia and paralogia. No other reflex or sign was constant for the group or for the same patient throughout the same examination.

As the interrogation progressed over a period of from two to three hours the patients were given additional amounts of morphine and scopolamine. The various eye signs, the subjective and objective symptoms of scopolamine administration, and the accumulated dose of pentothal usually indicated the need for about one-half the quantity of morphine and scopolamine originally injected. The intramuscular or intravenous route was chosen according to the rapidity of onset of effect, and duration of effect desired from these drugs. Their sedative action was immediately reflected in the decreased need for additional pentothal. When the examinations extended past the fifth and sixth hours, it was occasionally necessary to repeat the medications employing the same criteria to determine the agent, quantity, and route.

The total amount of pentothal administered varied between 48 cc. and 79 cc., while the total dose of morphine was from grs. 1/2 to grs. 3/4 and scopolamine doses ranged between grs. 1/75 and 1/100. The examinations lasted between 2½ and 11¼ hours. The larger amounts of drugs were required during the more extended procedures. There were no frank complications encountered in the series, although two subjects exhibited what might have been the early signs of scopolamine overdosage. The anesthetic equipment and apparatus, as well as alaleptic drugs, were constantly within arm's reach, but were never required.

In the last subject examined, a 58-year-old male, premedication with seconal was omitted because of a questionable history of pulmonary pathology. Induction medication consisted of intravenous morphine grs. 1/6 and scopolamine grs. 1/100. (The ratio was altered for the same reason.) As an attempt was made to engage the subject in conversation, 6 cc. of 2½ per cent sodium pentothal was slowly injected. It soon became apparent that the patient had become negativistic, but not until approximately 15 cc. of pentothal had been injected. His response to stimuli was characteristic of a light plane of anesthesia, but he could not be induced to give voice to obvious pain. During the next hour and a half, additional pentothal was administered in the hope that a depth of anesthesia could be achieved which would abolish the protective mechanism. After a total of 28 cc. of pentothal had been injected, over two and a half hours time, the realization that he was then too deeply narcotized dawned upon us. As a rapid solution, we chose to administer a solution of picrotoxin containing 3 mg. per cc. Five minute intervals elapsed between the injection of each cc. until 9 mg. had been administered. The patient's sleep was undisturbed except for taking blood pressure recordings (which did not change) and an examination of the pupillary reflexes. After fifteen minutes he responded instantly to stimulation and began to reveal incriminating evidence against himself within an hour.

Reports on the use of coramine, ephedrine, caffeine and methedrin for cerebral stimulation in narco-analysis had gone unnoticed in our review of the literature until we accidentally discovered similarity in the action of picrotoxin and these agents already described by several authors. Perhaps we will find the drugs a beneficial addition to our technique. We are certainly eager to investigate their use in narco-analysis.

In addition to the physical characteristics of speech and body enumerated above, the content and quality of the replies obtained from the patients was a fairly consistent guide to the depth of narcosis and the success of the examination. The modification of consciousness by the narcotics was characterized by confusion, bewilderment, inability to assay and select thought, impoverishment of vocabulary, automatic rather than reasoned responses, disturbed memory, expanded or contracted sequency of chronology, and the loss of discrimination between what was real and what was illusory.

The interrogation during narco-analysis was performed almost exclusively by members of the Department of Protection and Investigation. Their skill in phrasing the questions and evading the ego protective mechanisms of the subconscious mind was necessary to secure a complete examination. At this time we have no means of evaluating to what degree the drug or drug technique influenced the success of the tests and to what degree the psychology of interrogation was responsible for the end result.

The technique of questioning varied in each case according to what was known about the patient's personality through history and interview, the seriousness of the legal charges, the patient's attitude under narco-analysis and his rapport with the investigators. In the beginning the questions were directed at establishing the identity of the patient and associating him with the scene of the crime and the space of time involved. As the desired plane of anesthesia was approached, the questions were more skillfully worded and pointed. Key questions were reworded when it was obvious that the patient was withholding the truth, and the fact of a given denial was quickly passed over and ignored. At times it was necessary to check the facts obtained by reference to the police authorities who accompanied the patient, because there was no other way for the examiner to distinguish truth from fantasy. Persistent careful questioning reduced the ambiguities, but did not eliminate them entirely. We must indicate that our experience with pentothal and scopolamine did not bear out the conclusions of House and De River in that our patients could sometimes lie and their reasoning powers were sometimes present though much distorted. When the examination followed many weeks, sometimes years, of intensive questioning and investigation, it was much more difficult to evade the defenses. The best results were obtained when the narco-analysis occurred early in the investigation, prior to repeated and severe questioning.

The most valuable interrogation period lasted from five minutes to one hour, after which unless more pentothal or scopolamine was injected and the patient deepened in anesthesia, he rapidly recovered, and became aware that he had been questioned about his secrets. Depending upon his underlying personality structure, his fear of discovery, or his degree of disillusion in the interrogators, he became negativistic, hostile, or completely assaultive. Some patients had to be forcibly restrained during this period to prevent them from injuring themselves or others. The police authorities continued questioning and sometimes, because of the patient's regressive, diffused anger, the assumption that he had already been "tricked" into confession, and his still limited sense of discretion, he defiantly acknowledged his guilt. As the excitement stage passed, the patient either fell back on his original story or verified the confessed material.

The decision to continue or terminate the narco-analysis was shared with the Department of Protection and Investigation, although it was modified by the Division of Anesthesiology only when we felt that a more effective state of narcosis could be or could not be achieved or was contraindicated by the patient's physical condition. It was necessary to carefully guard against mental fatigue and heightened suggestibility during the last hours of the lengthy examinations. In the final stages of narco-analysis an attempt to assuage the guilt feelings that arose out of recollection of the offense was made by indicating that the confession may well have been an indication that the patient was ready to make amends, was remorseful, and had "learned his lesson."

In our series of ten cases confessions of guilt were obtained from three. These were fully acknowledged and elaborated upon by the subjects the following day. The other seven subjects divulged a sufficient amount of new material withheld from previous investigators, and conducted themselves in a manner to convince the authorities of their innocence. In most of these cases subsequent police investigation has now substantiated their claim.

Tape recordings of the entire conversation during the interrogation were made by the Department of Protection and Investigation. They remain in the custody of the Department as an integral portion of their report to the authorities requesting the investigation. It is important to remember that although the recordings of these investigations have been admitted to the court records, they are valuable only when they reveal convicting facts or clues leading to facts. Thus, even the innocent who might have been induced to give incriminating answers under narco-analysis are protected by the absence of substantiating facts and evidence. Until the legal test of the so-called "truth serums" has been thoroughly established, they will not stand alone as convicting evidence.

COMMENT

The narco-analytical experience obtained in the criminal interrogation of these ten cases cannot be deemed sufficient to warrant the postulation of recommendations, of theory, or dogma. Outstanding among the impressions obtained was the realization that a thorough clinical investigation of the anesthetic agents, and the techniques of their administration for this purpose has never been made under critical conditions.

Two major differences from ordinary narco-analysis and the method described above must be stressed. First the obliviscence of consciousness was invariably longer than average, sometimes requiring maximum tolerated doses of the agent employed. Second, the patient was maintained in a plane of anesthesia seldom required for so long in simple narco-analysis.

The anesthesiologist can be of assistance to the criminologist and the psychiatrist in evaluating the anesthetic agents, in recommending the technique of their administration, in preventing, recognizing, and caring for the complications which might ensue from their use. From our experience it is obvious that narco-analysis is the utilization of a plane of anesthesia for probing of the mind, and that it is difficult to maintain that plane of anesthesia for prolonged periods with such agents as pentothal and scopolamine.

This is a preliminary report; we feel that our work has only begun. The most ideal facilities are close at hand for us to employ all of the anesthetic agents, experiment with the techniques of administration, and to utilize them in all types of crime regardless of the moderation. With the full support and cooperation of the law enforcement agencies of this state, which we appear to have, such an investigation is possible.

Trial and error may dull our enthusiasm, but these first ten cases have not. We must claim 100 per cent success in the detection of deception.

SUMMARY

1. A short review of the historical development and the various hypotheses relating to narco-analysis for criminal interrogation is presented.

2. Various ethical and forensic problems which may arise with the use of this technique are described.

3. With the signing of a release by the patient permitting use of his testimony derived in drug narcosis, the technique may have limited value in courts of law to aid establishing guilt or innocence; weeding out false avowers of guilt, and exposing malingerers.

4. The vital participation of the Department of Protection and Investigation in this joint project is outlined.

5. Narco-analysis with pentothal, scopolamine, and morphine was utilized for the successful criminal interrogation of ten subjects. The techniques and observations from our experience are presented.

6. Thorough knowledge of the patient's background and personality, as well as the events leading up to the imprisonment or investigation were necessary in devising an approach to questioning unique for each patient.

7. Prolonged, deep narcosis exceeding the limits usually employed with narco-analysis and persistence in questioning had to be employed in the technique of interrogation.

8. The possibilities for research effort on the part of the anesthesiologist have been outlined.

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MEDICAL HISTORY DEPARTMENT ESTABLISHED

University of Wisconsin regents recently voted to set up a separate department of the history of medicine in the University Medical school at Madison. The new department will be headed by Dr. Erwin H. Ackerknecht, who came to the University in January, 1947, as its first professor of the history of medicine. Dr. Ackerknecht contributed the paper "Medical History of Wisconsin" that appeared in the February (80th Anniversary) issue of The Journal-Lancet.

Dr. Ackerknecht, at one time the only full professor of medical history in the nation, was born in Germany and received his medical degree at the University of Leipzig in 1931. From 1933 to 1939 he studied at the Sorbonne in Paris to receive a degree of diplomate of ethnology. He came to the United States in 1941 after a stint in the French army. In this country he was associated with the Museum of Natural History in New York and Johns Hopkins university prior to coming to Wisconsin.

CANCER RESEARCH GRANTS ANNOUNCED

Among the recent public health service grants totaling $1,160,818 for cancer research in the various institutions throughout the country were several allocated to the University of Minnesota. These four grants include: $8,023 to Dr. Edward Eaton Mason for his project on gastric secretion and stomach cancer; $3,978 to Dr. Sheldon C. Reed for study of the biology of human breast cancer with particular emphasis upon heredity; $7,685 to Dr. Claude R. Hitchcock for research into the chemical induction of cancer in inbred strains of mice; and $14,040 to Dr. John J. Wild for investigation of normal and malignant tissues studied by the use of ultrasound.

Teaching grants of $5,000 were also awarded to Dr. W. F. Potter of the University of North Dakota and Dr. David F. Mitchell of the University of Minnesota.

Group Therapy in a Child Guidance Clinic[*]

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In recent years there has been an increasing volume of literature reporting the application of group techniques to the problems of individuals with rather serious personality problems. During the war, psychiatrists, social workers and psychologists tried to adapt their therapeutic skills to deal with case loads which became astronomical in number by comparison with the number of clients that could be seen individually. Slavson,[1] Clarke and Law,[2] Moreno,[3] Bion,[4] Lippitt,[5] Lewin and his students,[6] Konopka,[7] Axline[8] and many others have written about various forms of group therapy. This term came to mean anything that was done in the presence of more than three persons with the aim of altering the reaction patterns of the subjects. Efforts ranged from a series of lectures by the leader with no audience participation to mobilizations of individual feelings into a dynamic emotional experience with real therapeutic value.

In child guidance there has been considerable work with groups of children and some scattered reports have been made of attempts to work with parents in groups. After an exploratory series of group interviews in 1948, the authors decided to organize two groups of parents and two groups of children early in 1949.[‡] From about 25 cases referred by the Child Study Department of the Minneapolis school system, eleven children and their mothers were selected after a preliminary interview with the parent to explain the procedure and estimate the suitability of the child and the parent for group work. It was decided to keep the children's groups somewhat homogeneous both as to age and sex. In general the behavior disorders were also similar. There were two groups: five boys five and six years of age were seen together; six others, also boys but ranging in age from eight to 11, were seen by another staff member. Not enough girls were included in the referrals to form a group at that time. The mothers of the younger boys met with one staff member and the older boys' mothers with another. All groups met at the same time for an hour and a half each week for about three months. For various reasons the sessions were terminated at the end of the school year.

All of the boys had difficulty in adjusting to social situations. They either withdrew from group activities at school or demanded individual attention from their teachers and in that way demonstrated their inability to participate in the classroom situation. Their needs for attention were such that they disrupted the class rooms. The teachers described individual boys with phrases such as these: "He can't play with the other children without fighting" . . . "He is always very submissive except when crossed and then he loses control of himself" . . . or, "His mother says he is all right at home but in school he can't get along with anyone." The parents gave descriptions which were pretty much variations on the theme that they could not understand their children, that they were unpredictable, self-centered, played alone or had to dominate other children. If they could not dominate they withdrew or flew into a rage. Our observations indicated that the boys were insecure, inhibited and fearful children whose hostile and aggressive impulses sometimes burst out in rage reactions. All seemed quite unsocialized.

The interviews with the boys were relatively unstructured. They met with the staff member in an ordinary office from which most breakable objects had been removed. They were given simple toys: water was available as were clay, paper and crayons. They were encouraged to initiate play of their own choosing. Group activities were encouraged but were not obligatory. The therapist's function was complex. Primarily his job was to facilitate in every way possible the emotional growth of the child so that the child could express and come to terms with himself and his problems. The child could then carry over into school and home new, and presumably better, means of dealing with his peers and contemporaries. In the group he could expose his old and unsatisfactory behavior patterns without too much danger of being hurt as he could depend on the therapist for support and understanding. The group also provided a social situation for the children to try out new response patterns in a permissive atmosphere. Because of the office setting, the therapist was sometimes forced to exert controls in addition to those which are normally part of any therapeutic situation.

The therapist-leader of the older boys made the following note: "This group found release for its collective hostilities very soon after its first meeting. The boys set about destroying systematically everything that was not forbidden (and some things were) . . . There were numerous interruptions of otherwise constructive activities. Almost spontaneously the whole group would cease working with clay or making model planes and make the building ring with ear-splitting shrieks, accompanied by hammering on a metal desk to rhumba rhythms . . . There were occasional forays into nearby offices . . . A streak (like Superman in a hurry) would materialize into a grimy little boy hiding under a table or chair as often as not hurling imprecations at startled bystanders or at some small hellion who was in hot pursuit. . . . Once or twice a boy or two came in, paid his respects, and then departed to play in the park across the street." These notes conclude with the therapist's comment: "It is scarcely necessary to add that these variations were neither planned by the therapist nor particularly satisfying to him."

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[*] Presented to the Northwestern Pediatric Society, September 29, 1949. Dr. S. G. Law, Dr. George M. Cowan, Mrs. Janet Wood and Miss Barbara Hall participated in this study, and assisted in preparation of the report.

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[‡] The project was supported in part by a grant from the Board of Directors of the Stevens Avenue Home for Children and Aged Women in Minneapolis.

The boys soon found their own leader not so much because of his size as on the basis of his ability to dominate and control the others. Johnny became the tacitly acknowledged leader, most of the time. Bobby, on the other hand, was the butt of practical jokes and had the least prestige. This group structure was not rigid, however, and sub-groups formed and dissolved with great rapidity depending on the activity of the moment. Bobby would ally himself with a stronger and more aggressive boy who could, for a time, then displace Johnny from his position of dominance. Or others would band together to "get" another individual whose behavior interfered with group activity. The therapist tried to protect Bobby or the other victims from too severe manhandling and would, at times, arbitrate disputes. He would try to encourage verbal expressions as substitutes for behavioral aggression. Occasionally some interpretation could be given to the group though this had limited value. The boys did discuss each other's behavior and remarks both among themselves and with the therapist. Towards the end of the sessions there was more group cohesion and a less rigid social structure. John was able to allow others to lead in some forms of activity and Bobby became an actively participating member of the group. (Bobby had been provoking a good deal of the aggression the other boys heaped upon him because of his need to be punished.)

On the whole we concluded that the 11 boys, especially the older ones, were able to release many of their hostile and aggressive impulses. Whether or not this was sufficiently therapeutic to warrant the conclusion that they were "cured" we are hesitant to say. The therapists felt that progress was not as great as they had expected, though both were judging by standards worked out from experience in individual sessions. Reports from the parents and the schools were that the behavior of most of the boys had improved. We accepted these reports with many reservations as changed behavior does not necessarily mean better adjustment. It was true that the parents, and perhaps the teachers, were eventually better able to understand their children and were more accepting of their behavior. As the parents became more tolerant the boys had less need to rebel.

The sessions with the mothers were also quite permissive. At the time of the preliminary interview they were told that their problems were like those of many mothers and that we believed mutual discussion of those problems could be helpful. This was repeated and amplified when the mothers met for the first time as a group. The leader or therapist then invited comment from anyone and waited for discussion to begin. There was no schedule of topics to be covered and the sessions were not of lecture type. The therapist remained in the background as much as possible. His function was to observe and clarify expressed or implied attitudes and feelings. In answer to direct questions he would try to turn discussion back to the group rather than give advice or a direct answer whenever this seemed possible. Questions of fact could, of course, be handled directly and as simply as possible without elaborate discussion of the dynamics of behavior.

In the first meeting several of the women expressed resentment towards the schools as they felt that they had been more or less forced to come for help. This feeling of hostility seemed to be the common ground on which they could all meet. The mothers came gradually to the realization that they were projecting their own inadequacies onto the schools and that their complaints were unfounded. Once a common ground was established the mothers were all eager to have help and to talk about their problems. All had the goal of being good parents; all wanted to be told what was the "right" way to handle their children. They were all confused between what they felt was right and what they had been told was right. Very soon the mothers brought their therapist-leader face to face with the dilemma which exists in the field of child guidance: we can recognize pathological factors in a child's emotional life, but we are far from clear when we discuss or try to describe ways to provide the milieu for healthy growth. A recurring problem with which the group and the therapist struggled constantly and which was never completely resolved was why we could not "do anything" to their children to make them behave better or tell parents what to do. The mothers all participated in threshing out various theories for meeting life situations. Throughout the discussions they were concerned primarily with the problems of their children as those problems affected them. There was little in the interviews which would indicate that the women saw their own personality adjustment as in need of overhauling. They did not come to us for help in solving their own problems although we felt that some of them did have the strength necessary to face and resolve their own unconscious conflicts. Our approach was on a superficial level similar to "attitude therapy." Whether more basic solutions at a subconscious level would have been possible in additional group sessions was debatable.

What the mothers got from the group sessions in terms of actual change in their ability to handle problems it is difficult to know. They did become more tolerant of the children. Certainly there was catharsis, but from the verbalization there was little indication of meaningful modification of basic attitudes. However, a value, which we think was clearly shown and not to be minimized was the enjoyment of the session. An *esprit de corps* was developed quickly and it was very clear that the group had meaning on this level for the mothers. For an hour and a half each week their children were the complete responsibility of someone else. Their enjoyment was shown by the manner in which they turned the boys over to the child therapists, the attitudes of relief when the door closed, and their surprise at the passage of time when the period was over.

Their group discussions revealed them as women with limited social contacts or those who were socially uncomfortable. This was a group in which they could easily find a place as they all shared the knowledge that each of the others had problems, too. In one group, two women definitely dominated the discussions and there was frequently rivalry between them for control. On one occasion when one of the rivals for dominance had succeeded in almost controlling the session, the second woman had a temper tantrum with her child on the way out of the office, a tantrum like the tantrums she described in her child. Another woman contributed almost nothing to the discussions but she attended regularly.

One young mother had been remarried to her husband three times. The final marriage came because at the time of the most recent divorce the Court had awarded custody of the children to her husband. The wife frankly remarried as the only way of getting her children back, although she knew that her husband would continue to punish her for her indiscretions while he was away from home in military service.

Another woman was divorced and had married a second time but to a different man. He rejected her children completely so that she divided her time between the children who were with her mother, and her husband, living alternate weeks with each.

One mother was an invalid and found herself unable to cope with a hyperactive son. Another had an illegitimate child and feared disgrace when her child discovered the facts of his paternity.

The husband of another was in a mental hospital but he was expected home shortly, improved but not cured. There was very real fear of him as a result of the physical and verbal abuse she suffered prior to his committment.

Anyone of these environmental situations were severe enough to call for prolonged intensive therapy for a person of average integration and ability to cope with life. That these women were maladjusted must be evident from the descriptions we have given of them and their children. In a sense, however, they were adjusted to their maladjustment. As they projected their feelings of inadequacy onto the school system toward which they felt hostile, so did they project their feelings about their children onto the children. It is diagnostic of insecurity and deep unconscious feelings of inadequacy when parents ask, "how do I make my boy behave?", as these mothers did. He who answers such a question lightly does so at his own peril for the parent who asks is saying by the very question that he or she is incapable of following the advice. The parent is seeking an answer outside of himself and the ability to apply the suggestion is not present. There are no blue-prints for the arduous task of rearing children; each parent must eventually find within himself a solution with which he can be comfortable.

We felt that these mothers were for the most part still in the stage of settling into therapy when the sessions were discontinued. They were offered individual interviews, but this was too threatening for most of them to accept, probably because this move was premature. However, two women did return later and professed to get considerable help. The bright side of the picture is that these women managed to come for help if only on the pretext of bringing their children and that they were able to discuss their problems. There is every reason to suspect that most of them would have rejected individual therapy at first, as most of them did later.

Our conclusions were (1) that group therapy may offer a means of reaching mothers who are otherwise inaccessible to treatment; (2) that some mothers derive definite benefits from group therapy, albeit on a superficial level; (3) that no definite time limits should be set for a group of mothers (or youngsters); (4) as yet we have no opinion as to whether group or individual therapy is more efficient or economical; (5) criteria for selection of both children and parents for group treatment as described here needs to be re-evaluated.

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ARCTIC HEALTH STATION

The Alaska field station of the Public Health Service has been officially named the Arctic Health Research Center, and from its headquarters at Anchorage will make further development of basic research in health and related problems which are peculiar to low-temperature environments. The program includes both long and short term studies in environmental sanitation, bacteriology, physiology, biochemistry, entomology and studies in animal-borne diseases.

A scientific research library, the first of its kind in the North American Arctic, has been established and is already providing reference and other services for the Research Center staff and other professional workers in arctic areas.

Antihistaminic Prophylaxis and Treatment of Respiratory Infections

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IN January, 1949, Brewster[2] reported excellent results in the treatment of common colds with several different antihistaminic drugs. The percentage of patients whose colds were aborted varied inversely with the interval between onset of symptoms and the beginning of antihistaminic treatment. Arminio and Sweet[1] reported on the use of an antihistaminic drug in the prophylaxis of colds. They used thonzylamine hydrochloride, which is sold under the trade name of Neohetramine, and gave one 50 mg. tablet daily to one group of subjects, two 50 mg. tablets daily to a second group, and three tablets daily to a third. There were 100 subjects in each group, and 300 other subjects who received placebos were used as controls. Only 20 per cent of the controls remained free of symptoms of colds over a five-month period, whereas over 80 per cent of the group of subjects receiving one tablet daily presented no symptoms of colds during the same period. Over 90 per cent of the other two experimental groups had no colds.

During the winter of 1949-50 a unique opportunity presented itself of studying the effects of antihistaminic medication on colds in the Elizabeth Kenny Institute in Minneapolis. Any reduction in the frequency or duration of colds would be of great importance at the Institute, for a cold usually causes at least a few days' interruption of a patient's packs, stretching, and other therapy. Thus, rehabilitation is delayed, hospitalization and resulting costs are raised. Accordingly, a study was set up which utilized all the Institute patients 15 years of age or younger. Thonzylamine HCl was chosen as the antihistaminic drug to be used, since Arminio and Sweet had reported such great success in prophylaxis of colds with it, and since it is known[3] to have few and mild side effects. Syrup of Neohetramine was the particular preparation employed, since by using a liquid the reduced doses for the pediatric age group could easily be obtained.

PROCEDURE

All patients in the pediatric age group were assigned to either the experimental or the control group. The groups were selected by taking the patients in alphabetical order and placing them alternately in the two groups. The groups did not remain of the same size, for patients were discharged from the Institute throughout the period of this study, and the two groups were not always equally affected. As new patients were admitted, they likewise were assigned to one group or the other. Patients who had any infection of the respiratory tract at the outset of the study were not included, but they were added to one group or the other as soon as they were judged to have recovered.

Patients in the experimental group were given Syrup of Neohetramine twice daily in the first period of the study. The dosage was based on weight. The adult dose used by Arminio and Sweet is 50 mg.; on this basis the following schedule was worked out: Patients up to 25 pounds in weight received 12.5 mg. in each dose; between 25 and 40 pounds, the dose was 19 mg., and over 40 pounds 25 mg. was given each time. No placebo medication was given to the control group, inasmuch as none of the patients were told of the purpose of the study or knew what the medication was. All patients received some sort of medication daily — vitamins if nothing else — and the addition of the antihistaminic to the routines of some of the patients was scarcely noticed.

Each subject was seen on rounds every day. In addition, the nursing staff was asked to call to the attention of the intern or resident all patients who had any elevation of temperature, sneezing, coughing, or nasal discharge. Those patients who developed respiratory infections were checked daily until they were judged to have recovered completely.

Some of the patients developed more than the relatively mild symptoms of the common cold—nasal discharge, sneezing, coughing, low-grade fever, mild malaise. A few developed otitis media, bronchitis, or broncho-pneumonia. In all instances, the first signs noted were those of an uncomplicated common cold, and hence data regarding all such patients are included in the tabulations to be presented.

After the study had been carried on for 31 days, it was obvious that some patients in both groups were having colds. No tabulation or analysis of data was made at that time, and it was not known whether any difference existed between the two groups. However, the occurrence of any colds at all in the experimental group suggested that perhaps the frequency of medication should be raised. Therefore, for a period of 35 days, the doses described previously were given three times daily instead of two.

RESULTS

The data are summarized in Tables I and II. It will be seen that a significant proportion of patients in both experimental and control groups had colds during both periods of the study. In the first period, when Neohetramine was given b. i. d., 48 per cent of the experimental group had colds as compared with 69 per cent of the controls. This difference of 21 per cent in favor of the experimental group fails to meet even the 10 per cent level of confidence on the chi-squared test of significance. It would therefore not be regarded as a reliable difference. During the second period of the study there was again a 21 per cent difference in the proportion of subjects having colds. This time, however, it was the control group which had the lower incidence. This difference also fails to meet the 10 per cent level of confidence. Since neither difference is in the range generally regarded as significant and since the differences are in opposite directions, it seems safe to assume that chance factors account for both differences.

TABLE I
Results of First Period, 31 Days.
Experimental group received Neohetramine b. i. d.

	Experimental	Control
Total number of subjects	25	26
Number and per cent having URI's	12—48%	18—69%
Number and per cent free from URI's	13—52%	8—31%
Average duration of URI's	8.7 days	9.4 days
Average number of days of rectal temperature over 100	2.2 days	1.5 days
Average age of subjects	7.5 years	6.4 years
Average age of URI patients	5.4 years	5.2 years
Average age of well subjects	9.5 years	8.9 years

There were differences noted in the duration of the respiratory infections in the two groups, but because of the great amount of variability, the differences found are not statistically significant, using the *t* test.

TABLE II
Results of Second Period, 35 days.
Experimental Group Received Neohetramine t. i. d.

	Experimental	Control
Total number of subjects	24	34
Number and per cent having URI's	12—50%	10—29%
Number and per cent free from URI	12—50%	24—71%
Average duration of URI's	8.0 days	13.0 days
Average number of days of rectal temperature over 100	1.8 days	2.2 days
Average age of all subjects	7.2 years	6.0 years
Average age of URI patients	3.5 years	2.7 years
Average age of well patients	10.9 years	7.4 years

In both groups the patients who developed colds had an average age lower than that of the patients who remained free from colds. Although the differences are consistent, none is statistically significant.

DISCUSSION

The results of this study are in direct contradiction to the published results of Brewster and of Arminio and Sweet, for no evidence was found to support the thesis that the antihistaminic medication either prevented colds or shortened their duration. The number of subjects used in the present study is far less than the numbers used in either of the other investigations. It is also true that the length of time the patients were observed—a total of 66 days—is less than half the period covered by Arminio and Sweet. These circumstances must be taken into account in evaluating the present study.

Against these admitted weaknesses should be set certain other facts. The patients in the present study were all housed under one roof for the period of observation. They were examined daily by members of the house and visiting staffs and by the nurses. This degree of control of the environment and this amount of medical evaluation of the subjects is not equalled in any previously reported study.

No previously reported study has used subjects in the pediatric age range. It seems unlikely that this fact explains the lack of agreement between the studies already referred to and the present investigation. The possibility must be considered, however, that differences between children and adults in allergic manifestations and in response to antihistaminic medication account for the contradictory results.

SUMMARY

A study was made of the effect of thonzylamine HCl (Neohetramine) in preventing and aborting common respiratory infections in pediatric patients at the Elizabeth Kenny Institute. For a period of 31 days, 26 controls receiving no medication were compared with 25 patients receiving thonzylamine twice daily. Doses ranged from 12.5 mg. (25 mg. daily) for patients under 25 lb. to 25 mg. (50 mg. daily) for patients over 40 lb.

During a second period of 35 days, 34 controls were compared with 24 patients receiving the same doses of thonzylamine three times daily.

No reliable differences were found in the incidence of respiratory infections in the two groups, in the average duration of the colds, or in the average number of days of fever.

Thonzylamine in the doses used is ineffective either in prophylaxis or in treatment of common colds in children.

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The author wishes to express thanks to Dr. E. J. Huenekens, Medical Director of the Elizabeth Kenny Institute and Dr. Forrest H. Adams, Chief of Pediatrics at the Institute for their support of this research. Grateful acknowledgment is also made to Drs. DeWitt Baldwin, George Lund and William Bevis, the interns who did much of the examining of the patients and the tabulation of the data. Prof. A. E. Treloar of the University of Minnesota Medical School gave valuable help in statistical analysis.

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Madura Foot or Mycetoma Pedis

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Madura foot is a condition which, although relatively rare in this country, is, nevertheless, of importance because of the disability its causes.

First described by Gill in 1842 as a disease endemic in Madura, India, it has since been reported from many arid, sub-tropical and tropical regions, and from temperate regions as far north as Canada.[1] An excellent account of the history of the disease can be found in a recent report by Reilly and Steel,[2] who emphasize that the condition is not entirely foreign to the United States, occasional cases having been reported since 1896. These authors have collected from the literature 49 cases originating in the United States. An additional three cases of mycetoma of the foot and one case of the hand were reported by Meyerding and Evert[3] in 1944.

Case Report

The following case report is typical of the disease:

A 36-year old farm housewife was seen in August, 1934 because of swelling and lesions of the left foot which had been discharging pus at varied intervals for about five years. She believed the trouble had begun when she broke the foot in an accident, the nature of which she did not recall. For three months previous to admission, there had been marked increase in the swelling which had not been relieved by manipulation by a local "bone setter." There were no other complaints.

The patient's temperature was normal and the general examination revealed nothing unusual, except the left foot which was moderately swollen and tender. There was no limitation of motion. Several small crusted areas were noted on the medial aspect of the foot and healed scars of older lesions were tender. X-rays of the foot and ankle showed no evidence of bony pathology. A tentative diagnosis of tuberculosis was made and the extremity was immobilized in a cast.

Two months later when the cast was removed, numerous granulating areas and draining sinuses were found to be present. The character of the drainage was not noted. The patient was instructed to continue on crutches and local treatment with Beck's bismuth paste was instituted. Six months later the sinuses were healed; there was only slight swelling of the foot and the patient was able to bear weight without pain. In August, 1935, one year after the first visit, there was still slight swelling of the foot, but all the sinuses were healed. There was no drainage and the patient walked well, although with some discomfort in the longitudinal arch. Approximately ten years later, in October, 1945, the patient returned again. She stated that the foot had remained healed until six months before when it had again begun to drain thin pus through several openings.

Examination at this time revealed the patient's general condition to be good. Her temperature was normal. In general, the examination was not remarkable. The left foot was swollen and was spotted by many granulating lesions which marked the opening of draining sinuses. Examination of the blood and urine revealed no abnormality. The Wassermann was negative. X-ray of the chest was normal.

She was again seen in February, 1946. The wounds of the foot had failed to heal in spite of local application of bismuth paste. The foot was markedly swollen; there was moderate limitation of motion of the ankle; there were several small draining sinuses; no granules were noted in the discharge. X-ray examination showed no involvement of the bone. The patient was treated in the hospital for three weeks receiving 50,000 units of penicillin every four hours. During this time, the drainage from the sinuses persisted, but became much decreased. Re-examination by x-ray, however, showed decrease in density in the lower portion of the tibia with some periosteal new bone formation. A biopsy was made by a curettage of a sinus, and the pathologist reported a granuloma of undetermined type. Cultures failed to demonstrate fungi.

After leaving the hospital, the patient got about on crutches, but the foot continued swollen and draining. There was, however very little pain and the patient's general condition remained good. Local treatment at this time consisted of the application of bismuth paste and sulfathiazole ointment. A saturated solution of potassium iodide, seven drops three times daily, was given for several months without apparent benefit. The condition continued to progress gradually, the sinuses healing occasionally, only to reopen and drain again after a short interval. The patient continued without weight-bearing and began to have some pain at times. Ultraviolet therapy was without benefit.

In August, 1948, she was having pain at rest, made worse by weight-bearing, the pain at times being severe enough to interfere with rest. The foot and ankle were markedly swollen throughout, especially across the dorsum of the foot which was held in equinus. The skin was markedly discolored and was pox-marked throughout almost its entire surface by small, elevated, granulating areas which marked the opening of sinuses from which seropurulent fluid drained in moderate amounts. Occasionally, new abscesses formed, broke and drained to constitute new sinuses. The patient's general condition was good, except for the debility caused by continuous and increasingly severe pain in the foot. X-rays showed increased density in the lower tibia, osteoporosis of the lower tibia and fibula, and sclerotic changes about the astragalocalcaneal joint. The other joints appeared normal. A tuberculosis patch test was negative. The patient was hospitalized and given streptomycin, one gram daily for two months. No local treatment was given during this period, except for frequent change of dressings. After three weeks under this treatment, x-ray examination demonstrated multiple areas of bone necrosis in the os calcis. At the end of two months, a cast was applied to the foot and the patient was discharged from the hospital on crutches.

She remained comfortable until February, 1949, when the foot again became painful. The cast was removed. The foot was found to be markedly swollen and draining from the many sinuses. X-ray examination showed almost complete involvement of the left os calcis without any sequestration, a definite extension of the process since the previous examination. Amputation was advised, but refused.

On February 27, 1949, the os calcis was thoroughly curetted as were several of the sinus tracts which were found to form a complicated network among the bones and tendons of the foot.

The report of the pathological examination was as follows: "There is a granulomatous and suppurative inflammation. One area contains tubercles consisting of epithelioid cells bounded by a zone of lymphocytes and containing necrotic centers. Giant cells are present. The specimen removed from the bone showed no evidence of tumor or inflammation." No colonies of fungus could be found.

The patient again wished to defer amputation and she was discharged from the hospital wearing a cast. A month later she was still having considerable pain and examination of the foot on removal of the cast showed no improvement. No granules were noted in the discharge from many sinuses.

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Amputation was finally agreed upon and was performed at the site of election below the knee on March 26, 1949. The wound healed by first intention. The patient was discharged from the hospital on April 11, 1949 entirely comfortable except for slight phantom pain at times. By June, 1949, she was able to get around well with a temporary plaster pylon, and in October, 1949, she was walking well with a regular prosthesis, entirely free from pain. There was no evidence of recurrence anywhere in the body. Her general health was markedly improved.

The pathological report of the amputated extremity was as follows: "The specimen consists of the left foot, ankle, and 17 centimeters of the distal leg. There are numerous sinus openings in the skin on the medial, posterior and lateral surfaces of the ankle and lower leg. There is a postoperative wound on the lateral surface of the heel measuring 5 centimeters in length. There is almost complete ankylosis of the ankle joint. There are multiple areas of softening in the os calcis.

"Histologic examination shows a chronic granulomatous inflammation with suppuration in the soft parts and also in the os calcis. One tubercle, indistinguishable from tuberculosis, is present in a section taken from the wall of one of the sinuses. It contains epithelioid cells, giant cells, and a small central area of necrosis. Areas of fibrosis are prominent and infiltrations with lymphocytes and plasma cells are a prominent feature. Typical actinomycotic ray fungi can be demonstrated in the sections. Diagnosis: Actinomycosis of foot, ankle, and os calcis left."

Discussion

Mycetoma is a chronic granulomatous lesion caused by fungi and characterized by indolent, inflammatory swellings which gradually soften and break down to form sinuses which discharge seropurulent or bloody fluid containing granules of various colors. The lesion is the most common in the foot. It occurs occasionally in the hands and may be seen more rarely in the leg, knee, neck and trunk. Most of the cases reported have occurred in male agricultural workers of the active age groups. It has been noted by a number of authors that the victims are usually those who habitually go barefoot about their work, and it is not surprising that most cases in the United States have been reported from southwestern areas. However, several cases have been reported from the central northwest.

The mode of inoculation is not known, but it is not unlikely that the fungus enters through a wound. In a majority of cases, the patient has recalled some trauma to the foot, such as a laceration or contusion occurring several months prior to the onset of symptoms. The victims frequently give a history of having worked barefoot in an agricultural region.

The causative fungi may be any of a variety of species of actinomycoses and maduromycoses, both of which are embraced by the term mycetoma or Madura foot. Although actinomycosis is frequently found in certain domestic animals, maduromycosis is apparently found only in man. Since the symptomatology and pathology of the disease are practically the same, regardless of the type of fungus present, the differentiation between these two types of fungi is not essential to the diagnosis of the condition. It is of interest to note, however, that while actinomycosis occurs more frequently in other parts of the body, maduromycosis, as a rule, is seen only in the extremities.

The clinical course of the disease is characterized by its unusually slow and relatively painless course which may extend over many months or even years. Although it may so extensively involve a certain region as to produce almost complete destruction, it seldom spreads to other parts. The first evidence of the disease may be a granulating lesion of the skin or subcutaneous tissue, or there may be a papule, or a nodule, with little pain or local heat. Although there is little disability at first, the lesion is always progressive. The nodule becomes somewhat tender and fixed. Finally, sometimes after a considerable time, softening occurs and the nodule degenerates to an abscess which breaks down to discharge the seropurulent granule containing fluid which is characteristic of the condition.[5,6] Through the repeated healing and breaking down of the draining points, sinuses are formed which come into elaborate intercommunication with other sinuses deep within the part. The foot may become swollen to two or three times its normal size and talipes equinus deformity may occur. Scattered over the surface of the skin are many ulcers and nodules. These openings lead to a complicated anastomosis of sinuses with eventually extensive destruction of all the tissues, even the bones and joints, of the region involved. In spite of this intensive local destruction, the general systemic reaction and pain are usually relatively slight, unless secondary infection occurs. In advanced cases of the disease, the x-ray films show various degrees of involvement of the bone[7] with periostitis, all stages of osteomyelitis, and an ankylosis of the joints.

Microscopically, the lesion is characteristic of an infectious granuloma and the specific fungus can usually be demonstrated in properly prepared sections of the lesion. Surrounding the fungus there is a local tissue reaction with round-cell infiltration and the formation of giant cells; eosinophils may be found as well as lipoid and pigment-bearing macrophages.

The diagnosis of the condition should not be difficult. Smith[8] has pointed out that a mycotic infection should always be suspected in every patient who has a chronic draining sinus, even though the clinical appearance of the lesion may be identical with those produced by a tubercle bacillus or by certain anærobic streptococci. Microscopic examination of the granules from the discharging sinuses shows the mycella of actinomycosis or of maduromycosis. The latter can also be demonstrated in cultures, although examination of the pus from the discharging sinus or a biopsy from the wall of the sinus may be more effective in demonstrating actinomycosis. The absence of a general systemic reaction or guinea pig inoculation will exclude tuberculosis.

The course is chronic and progressive, and a spontaneous cure does not occur. However, because discomfort is not marked and the patient's general health, as a rule, remains good, radical methods of cure are usually not resorted to until the disease is far-advanced. Potassium iodide in large doses is usually advised. Local treatment with iodide, two per cent copper sulfate, potassium permanganate, cautery and curettement have been used. Systemic treatment with iodine, bismuth, sodium tartrate, copper citrate, thyroid, oil of cinnamon, arsphenamine, and mercurochrome have been used. But in most cases reported, the disease has continued to progress in spite of these treatments. X-ray therapy and the administration of sulfonamides, penicillin and streptomycin have likewise failed to halt the progressive advance of the disease. No treatment except surgery has proved satisfactory. Local excision of the infected tissue may be tried in early cases, but sooner or later the patient comes to amputation of the extremity. This results in a rapid recovery. There seems to be no tendency to recurrence in other parts of the body.

SUMMARY

Mycetoma is a chronic, progressive, granulomatous, destructive lesion, most commonly of the foot. It occurs sporadically, even in the northern sections of the United States. A diagnosis of mycetoma must be considered in any such granulomatous condition, and is confirmed by finding the characteristic fungi in smears, cultures or biopsies from the affected part. Treatment by drugs and antibiotics has proved unsatisfactory. In early cases, wide excision of the involved tissue may be successful, but in most cases, amputation will finally be necessary and will result in rapid cure.

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Book Reviews

Medical Management of Gastrointestinal Disorders, by GARNETT CHERRY, M.D. Chicago: Year Book Publishers, Inc., 1950. Price, $6.75.

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This is one of the publishers' manuals, designed to inform the physician in general practice on special subjects. Diseases of the gastrointestinal tract are expounded in terms of common complaints; symptoms and associated physical finding are considered as diagnostic clues and as guides to plan the search for contributing information. Interpolated chapters deal with laboratory and roentgenographic procedures, with management of peptic ulcer, liver and gallbladder disease, gastric cancer and food allergies. Psychoneurotic manifestations and origin of gastrointestinal disturbances are stressed. Emphasis is given to diagnostic and therapeutic methods which have been proved, but are contemporary.

The charge of bias and dogmatism is anticipated and refuted on the ground that the statement of an individual opinion about a particular matter is less confusing and consequently more helpful than the discussion of several divergent concepts. That is, the author chooses diagnostic performance, interprets signs or propounds therapy without submitting supporting evidence. In most instances his declarations are sound and sensible; on some points, valid objections may be raised.

The book is a convenient size, well printed and easy to read. The index is good. Diet lists are suitable for patients' use.

J.B.C.

Electrocardiography, Fundamentals and Clinical Application, by LOUIS WOLFF, M.D. Philadelphia & London: W. B. Saunders Co., 187 pages, 1950. $4.50.

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In this book the author presents the subject of electrocardiography in a somewhat different manner than most texts. The basic principles of electrocardiography and their application to the clinical interpretation of electrocardiograms are presented in a simple and easily understandable way.

The work is divided into two parts, the first discussing the basic principles of electrocardiography; the second devoted to clinical electrocardiography. The discussion of unipolar and multiple chest leads is clearly presented, and other subjects are fully covered.

This text should be of great value to physicians and students who desire a simple practical presentation of the intricacies of present day electrocardiography. T.Z.

Proceedings of the First Clinical ACTH Conference, edited by JOHN R. MOTE. 624 pages. Philadelphia: The Blakiston Company, 1950. Price, $5.50.

- - - - - - - -

This book is the most complete account of the adrenal-controlling functions of the pituitary which has appeared in print. It has the further virtue of being strictly current in its treatment. It consists of 52 papers by as many groups of authors covering biochemical, physiological and clinical aspects of the role of ACTH in the total organism. The book is packed with new and classical observations and is a source work of unique value for all investigators in the field, especially for clinical investigators. For physicians interested in the application of ACTH to specific clinical problems the volume will be very useful. M.B.V.

Sex Without Fear, by S. A. LEWIN, M.D. and JOHN GILMORE, Ph.D. 121 pages. New York City: Lear Publishers, 1950. $3.00.

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This book was written by two physicians for the layman in response to a need for sound sex education. Terminology and phrasing are simple; explanations are clear and adequate; the illustrations are well executed and precise.

Various chapters deal with the male and female reproductive systems, the endocrine glands, the art of intercourse, sex desire and frigidity, pregnancy, "as the twig is bent" (how to tell your children about sex), sterility, the menopause and the male climacteric aphrodisiacs, contraception, abortion and venereal diseases. A 4¼ page glossary explains unfamiliar terms.

According to a statement at the front of the book, it ". . . is distributed ethically within the medical profession and its allied branches. Available to the public on physician's prescription."

E.B.B.

Clinical Use of a New Subcutaneous Mercurial Diuretic, Thiomerin[*]

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Minneapolis, Minnesota

Within the past year and a half several favorable reports on the new mercurial diuretic for subcutaneous injection, Thiomerin, have appeared.[1,2,3,4,5,6,7] This new drug was developed to reduce the cardiac toxicity associated with the older mercurial diuretic compounds and to provide a potent diuretic agent that is easily administered.

Thiomerin[‡] is the disodium salt of N-γ (carboxymethyl mercaptomercuri-B-methoxy) propyl camphoramic acid which is chemically similar to mercurophylline U.S.P. XIII (mercuzanthin) but the theophylline has been replaced by sodium mercaptacetate with the formation of a mercaptide. Lehman[8] has reported the cardiac toxicity of this compound given intravenously to anesthetized cats to be 1/160th that of other mercurials. Thiomerin is supplied in powder form with an ampule of distilled water. It dissolves readily in water and, when kept refrigerated, stability is maintained for several months. At room temperatures, breakdowns of solutions may occur at the end of three weeks. The appearance of cloudiness or color changes indicates breakdown and such solutions should be discarded. As now supplied, each cubic centimeter of solution contains 0.040 gm. of mercury.

This paper is a report of our experiences with Thiomerin based on a study of 204 cases of cardiac failure with edema.

Method of Study

Sixty-six hospitalized patients were observed under rigid conditions to exclude all extraneous factors that affect diuresis. All cases were stabilized on a regular sodium content diet averaging 10 gm. of NaCl per day. No ammonium chloride nor xanthine drugs were given. All cases were either not digitalized or were stabilized on maintenance doses of digitalis. The diuretic effect of bed rest was avoided by giving the diuretic either on admission or after the fifth hospital day. The patients were weighed on admission and again at 12 and 24 hour periods thereafter with the same set of scales. The urinary intakes were charted daily and the outputs were collected and measured at 12, 24, and 48 hours after administration of the diuretic agent. The weighing of the patients and their urinary output measurements were personally supervised by the author. In addition, the sites of all injections given were recorded on a form containing a figure of a human being.

One hundred thirty-eight clinic patients were followed at intervals of one to six weeks in the out-patient departments of the Minneapolis General and University of Minnesota hospitals.

Both groups received Thiomerin subcutaneously in one and two cc. doses. A total of 1,026 injections were recorded; of this total, 506 were one cc. and 520 two cc. doses. The hospitalized cases received one to 44 injections at intervals of one to seven days, the clinic patients one to 30 injections at one to six week intervals.

Diuretic Effect

Thirteen of the hospitalized patients received equal doses of subcutaneous Thiomerin and intravenous mercuzanthin at suitable intervals to compare their respective effects. Under the conditions listed above, in this small series, no significant differences in the diuretic effectiveness of the two drugs was observed.

The remaining 53 cases in the hospitalized group were divided into those patients (19) receiving one cc. and those (34) getting two cc. doses of Thiomerin subcutaneously. The first group averaged 3.8 lbs. and the second group 6.2 lbs. loss in weight per dose respectively until dry weight was attained. A small number of additional cases received Thiomerin intramuscularly and intravenously. No significant differences in total diuretic response occurred with these various routes of administration. This suggests that complete absorption of the drug usually results from subcutaneous injection sites.

The onset of diuresis occurred in two to four hours and the maximum diuretic effect was reached within 12 hours following subcutaneous administration of Thiomerin. In six cases, however, the diuresis continued for 48 hours; two of these cases had their greatest loss in weight in the second 24 hour period of study.

Criteria of satisfactory diuretic response in the hospitalized group when edematous was established as follows: For two cc. doses a weight loss of five lbs. or over per dose was called a good response; fair and poor results were indicated by losses in weight of three to five lbs. and under three lbs. respectively. Likewise, for one cc. doses, a weight loss per injection of three to five lbs. was considered good, one to three lbs. fair, and one lb. or less, poor. Under these criteria, 41 patients experienced a good diuretic result, 18 cases responded fairly well, and seven cases poorly to Thiomerin. The greatest weight loss recorded for a two cc. dose was 20 pounds (with no ammonium chloride nor xanthine supplement) and several patients lost 10 to 12 lbs. of weight after a single one cc. dose. High venous pressures (20 to 27 cm. citrate) observed in some cases did not reduce the diuretic effectiveness of subcutaneous doses of Thiomerin.

Of the 138 cases followed in the outpatient department, nearly all were maintained edema free with Thiomerin.

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[†] Medical Fellow, University of Minnesota Medical School.

[‡] Supplied by Campbell Products, Inc., New York.

Table I

Summary of Results

	Total Number of Injections	Total Number of Patients	Diuresis Number of Patients			Reactions Number of Patients	
			Good	Fair	Poor	Local	Systemic
Hospitalized Patients	407	66	41	18	7	9	2(?)
Clinic Patients	619	138	Generally satisfactory			11	0
Total	1026	204				20	2(?)

Toxic Reactions

Over the past ten months we have seen no evidence of irritation at the site of injection such as lumps or discoloration of the skin. This is partly due to the much greater stability of the Thiomerin which is currently available and partly to adequate instruction of nurses and patients on the technique of subcutaneous injection. We have found it desirable to use relatively fresh or refrigerated solutions of the drug, to knead the injection site after administration, to avoid injection into edematous or excessively fatty areas, and to use a needle at least 2.5 cm. in length to insure penetration of the subcutaneous fat.

Various local reactions were observed with the early lots of Thiomerin which were used in this study. These consisted in temporary mild soreness (usually brought out only in direct questioning of the patients) and small subcutaneous lumps less than one cm. in diameter. These lumps disappeared within 24 to 48 hours as a rule. Ten cases had small tender lumps which lasted from two to three weeks. In the entire series, three cases developed tender subcutanous lumps which persisted for three months. Biopsy of two of these lumps revealed a typical foreign body reaction (giant cells surrounded by lymphocytes and fibrosis). Four patients developed ecchymoses and several instances of yellowish discoloration of the skin over the injection site were observed but these disappeared in a few days and caused no ill effects. In three cases, the drug was given intradermally by error and sloughing of the skin took place. Sloughing also occurred in one case that received mercuzanthin intradermally by mistake. One of these sloughs resulted from the use of a stubby needle by a relative of the patient.

For all practical purposes, systemic reactions to thiomerin do not exist. Occasional instances of nausea, muscle cramps, and weakness secondary to rapid electrolyte loss occurred. In two cases, diarrhea of unknown etiology but possibly related to mercurial administration was noted. Repeated urinalyses failed to reveal the presence of renal irritation in the hospitalized group.

Discussion

Now that Thiomerin has been relatively stabilized and the technique of subcutaneous injection standardized, local reactions are minimal. Many patients specifically request Thiomerin in preference to the other mercurial diuretics. A few tolerated thiomerin well when they could not, because of associated pain, bear intramuscular injection of other mercurials. Obese patients tolerate the drug best intramuscularly or intravenously. The chief advantage of Thiomerin over other mercurial diuretics is its versatility; it can be given intravenously, intramuscularly, and subcutaneously. It is the most easily administered mercurial diuretic available today and patients appear to tolerate it better than the other preparations. Patients can be taught to administer the drug to themselves in maintenance doses with their weight as a guide thus saving time for themselves and for hospital personnel.

Summary

1. Thiomerin is a potent mercurial diuretic that is as effective subcutaneously as other mercurial diuretics given intravenously. Results have been reported above for 204 patients who received 1026 injections.

2. Local and systemic toxicity has been reduced to a minimum in this mercurial preparation.

3. Self administration by patients under the physician's direction is practical.

The author wishes to express his appreciation to George Fahr, professor of medicine in the University of Minnesota Medical School for his advice on the method of study, and to the medical fellows and the nurses on the wards and in the Cardiac Clinics of the Minneapolis General and University of Minnesota Hospitals for their assistance in preparing this report.

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Relief of Anal Pain

A Preliminary Report

David Miller, M.D.
Los Angeles, California

Many ointments and suppositories are available for the specific purpose of relieving anal pain, and many of these do give some degree of the promised relief. All of these preparations owe their pain-relieving effect to some anesthetic ingredient and the bland, soothing action of an oleaginous substance, usually cocoa butter. Ointments act by coating the lesion with these ingredients; suppositories, however, act either by absorption of the anesthetic agent (and its effect through the central nervous system) or by a topical effect, after liquefaction and oozing of the effective agent from the rectum back on to the lesion. Some of the ointments act rather rapidly; others more slowly because of the time required for the basic vehicle of the ointment to melt and liberate the effective ingredient. Among the prime disadvantages inherent in many of these preparations are allergic manifestations of some patients to certain of the ingredients; the use of narcotics in many of these preparations; awkwardness of the application of ointment with a tube, and the slow melting time of most suppositories.

A new type of suppository has been used for the relief of anal pain in approximately 75 selected cases. This new suppository is actually a double suppository consisting of an outer coating and an inner core, and which contains propyl bara amino benzoate as the anesthetic agent.[1] The prime physical characteristic of the outer coating is such that it disperses very rapidly, leaving a coating in the anal canal as it is inserted. This coating is extremely water soluble, has its anesthetic ingredient well dispersed, and is not dependent upon a low melting point. A coating of its anesthetic-acting ingredient is left on the surface with which it comes in contact in its passage through the anal canal, producing rapid topical anesthesia. Anal sphincter spasm is also lessened by this effect, thus adding to the patient's comfort. The inner core having a lower melting point than the conventional suppository melts rapidly freeing its content, which in turn, also acts topically by oozing back over the affected area and helps to prolong the soothing effect.

The early use of this type of suppository was confined to selected patients whose pain resulted from simple trauma of the anal canal. Because of its effectiveness, its use was then extended to ano-rectal postoperative patients on their first visit to the office. In some instances a supply was given to the patient with instructions to insert one about five minutes before having a stool. The patient was also instructed to hold the suppository for a few seconds against the anal orifice before allowing it to slip into the rectum. By so doing the topical deposit of the anesthetic preparation in the anal canal was assured. Passage of the stool was made easier and post evacuatory anal discomfort was lessened. This suppository is now being used almost routinely in the described type of cases and also for its topical anesthetic effect prior to an examination of a painful anal condition and upon the completion of an examination to relieve any anal discomfort that might have arisen after the use of the examining instruments.

It was found to give as much, or more, relief from pain as other commonly used preparations and the relief from pain in most cases was more rapid and insertion was easier and less painful than insertion of a nozzle for injection of ointments.

Conclusions

1. A new type of rectal suppository, for the relief of anal pain, has been evaluated clinically.

2. This type of suppository overcomes many of the disadvantages inherent in most preparations designed for such use.

3. This therapy has been found useful as adjunct treatment particularly prior to examination of many painful anal conditions and also to relieve discomfort that might arise after the use of examining instruments.

---

[1] The formula is as follows:

OUTER COATING	
N-lauryl colamino formyl-methyl-pyridineum chloride	0.1%
Propyl para amino benzoate	2.0%
Urea	2.5%
Bismuth sub gallate	5.0%
Zinc oxide	10.0%
Polyethylene glycol stearate	80.4%
INNER CORE	
Polyethylene glycol stearate	2.0%
Cod liver oil	2.5%
Balsam peru	3.0%
Beeswax	17.5%
Cocoa butter	75.0%

I am indebted to the Harrower Laboratory, Jersey City, New Jersey, who made available adequate quantities of these suppositories for this study.

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Metastatic Renal Malignancy

Louis F. Pine, M.D.*
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The occurrence of a clinical case of metastatic renal malignancy stimulated a review of the American literature on the subject and the autopsy records at the Worcester City Hospital.†

The theories of metastasis in cancer, including invasion of tissue spaces, and lymphatic or hematogenous spread are well known. That some tumors have a predilection for one method over another has been pointed out by Ewing. Sarcomas spread to regional lymphatics whereby the regional nodes become amalgamated, with a marked tendency to necrosis and later hematogenous spread. Paradoxic embolism has been mentioned by Zahn, one in a case of sarcoma of the seminal vesicle, the other in cancer of the thyroid. Boger describes the case of a primary cancer of the rectum with metastasis to the pelvic ureter and to the kidney on the left side. The lesions in the kidney replaced two or three of the pyramids in the lower pole. In view of the fact that no evidence of tumor cells could be found in the blood vessels or lymphatics of the ureter, he concluded that the kidney lesions were in the nature of implants from cells being carried into the kidney from the growth below in the ureter. It is well known that primary renal malignancy has the greatest incidence of spread to the other kidney, be it lymphatic spread or retrograde venous embolic phenomena.

Two thousand, nine hundred and fourteen autopsy records were reviewed and 407 cases of malignancy were found. The systemic distribution of malignancies was as follows: 34 per cent occurred in the G.I. tract; 22.8 per cent in the G.U. tract; 7.8 per cent in the respiratory system, and sarcomas in general had an incidence of 8 per cent. Of the 407 cases of cancer 19 had renal metastases, both kidneys being involved in 9 instances (47 per cent), and in 10 (53 per cent) only one side.

Analyzing the 19 cases which had metastatic renal disease, other organs involved were as follows: liver 9, adrenal 7, lungs 6, spleen 5, mediastinum 5, bones and mesentery 3, brain 2, pericardium, heart, ileum, colon, peritoneum, omentum and pancreas, one each. Regional lymph glands were involved in all cases, but undoubtedly distant lymphatic involvement must also have been present.

It was evident that the nature of the metastatic lesions found at autopsy was such as to preclude diagnosis clinically. The lesions were cortical and not extensive enough to produce any defect of the pelvis or calyceal system, the size of the lesions varying from 2.5 mm. to 9 mm. in diameter.

The incidence of metastatic renal malignancy in this series as compared with that of Abeshouse and Goldstein are shown in Table I:

Table I

			Incidence	
Cancer:	Autopsies	Metastases	Our Series	Abraham & Goldstein Series
Esophagus	13	1	7.6%	6.0%
Stomach	60	1	1.6	2.3
Large intestine	52	1	1.9	0.25
Breast	19	2	10.5	5.8
Kidney	7	2	28.5	26.5
Lung	24	5	20.8	15.6
Sarcoma all types	33	5	15.1	

To date there have been 1481 cases of metastatic renal malignancy reported in the literature, in which are included four clinical cases.

Case Reports*

Mrs. S. K., a housewife aged 44, entered the Worcester City Hospital September 15, 1948, complaining of hematuria of one week's duration accompanied by occasional attacks of severe sharp pain in the right lower quadrant lasting about an hour. Two days prior to admission a constant severe pain developed in the right flank radiating down into the right groin. She also had hourly diuria and nocturia. During the present illness she had some nausea, vomiting, and postprandial gaseous distress. A cough productive of brownish sputum had been present for the past three weeks.

Past history: Cholecystectomy and appendectomy had been performed in 1932 and a radical Wertheim operation for carcinoma of the cervix in July 1947. A left upper lobectomy, performed in July 1948 was diagnosed as metastatic epidermoid carcinoma.

On physical examination there was moderate rigidity of the muscles in the right flank and right lower quadrant. There was slight generalized abdominal tenderness, with marked tenderness at McBurney's point. No masses could be delineated.

Temperature, pulse and respiration were normal. N.P.N. was 45, white blood cell count was 13,000, hemoglobin was 75 per cent.

On September 15th she was cystoscoped and a worm-like clot observed in the right ureteral orifice. A 5Fr catheter was passed up the right ureter, at 20 cm. blood spurted around the catheter, at 25 cm. the catheter was pushed back to 22 cm. On the left a 5 Fr. catheter was passed 27 cm. with ease. Indigo carmine excretion showed: right, none; left, 4 min., good concentration. Retrograde pyelography: on the flat film the renal shadows were not well outlined. Tip of the right catheter was present at the lower aspect of L3, and catheter was displaced medially to within 5 mm. of the midline. Left catheter was present at tip L1. In the left upper ureter, kidney pelvis and upper calices filled. Two small middle calices also filled on the left. On the right side upper half of ureter was filled, extending not higher than the lower aspect of L3. A right oblique revealed the outline of right kidney better, but no filling was observed. The conclusion was that a tumor of right kidney was present, but that possibility of metastatic lesion cannot be excluded in view of past history.

---

*Lake Region Clinic, Devils Lake, North Dakota.

†Dr. Pine was formerly a resident in urology, Worcester City Hospital, Worcester, Massachusetts.

*Case courtesy of Dr. G. C. Tully, Urologist, Worcester City Hospital, Worcester, Massachusetts.

TABLE II
Autopsy Review

Type and Site Primary Neoplasm	Number of Cases	Number of Renal Metastases	Percent.
A. Carcinoma	(374)		
Mouth	2		
Nasopharynx	1		
Antrum	1		
Lungs	24	5	20.8
Bronchus	1		
Larynx	6		
Auditory canal	1		
Esophagus	13	1	7.6
Stomach	60	1	1.6
Pylorus	1		
Ileum	1		
Cecum	7		
Colon	21		
Sigmoid	20	1	5.0
Recto-sigmoid	4		
Rectum	12		
Anus	1		
Liver	15		
Gallbladder	8		
Common bile duct	1		
Pancreas	29	1	3.4
Cervix	21		
Uterus	6		
Breast	19	2	10.5
Ovary	7		
Adrenal	5	1	20.0
Kidney	7	2	23.8
Prostate	30		
Testicle	2		
Bladder	18		
Penis	2		
Skin	1		
General carcinomatosis	2		
Primary site unknown	3		
Brain	22		
B. Sarcoma	(3)		
Lung	1		
Uterus	1		
Brain (metastatic)	1		
C. Lymphosarcoma	(6)		
Generalized	3	1	33.3
Thymoma	1		
Liver	1		
Retroperitoneal	1	1	100.0
D. Lymphoblastoma	(3)		
Retroperitoneal	2		
Spleen	1		
E. Osteogenic sarcoma	3	1	33.3
F. Reticulum cell sarcoma	(8)		
Ascending colon	1		
Abdomen	1		
Cervical glands	1		
Spleen	1		
Generalized	4	1	12.5
G. Myxosarcoma	(4)		
Mesentery	1		
Left groin	1		
Left shoulder	1		
Right arm	1		
H. Malignant melanoma	6	1	16.5

Total number of autopsies	2914
Total number of malignancies	407
Total number of malignancies with renal metastases	19
Percentage of malignancies in entire series	13.9
Percentage of malignancies in entire series with renal metastases	0.65
Percentage of renal metastases in malignancy series	4.66

On September 18 a right nephrectomy was performed easily through the usual lumbar incision. Postoperative course was uneventful and patient was discharged 11 days later.

Pathological report by Dr. Raymond H. Goodale: "Specimen: Kidney, right. Gross: Specimen consists of a kidney weighing 211 gm. and measuring 13x6x5cm. The capsule strips with moderate difficulty leaving a pale brown surface. There are present on the surface two elevated nodules which are yellow-white in color. The larger of these measures 3½ cm. in diameter. Cut surface of the kidney reveals a pale yellow-brown surface, and one is unable to find medulla-cortex demarcations. The nodules have a firm, white surface, the larger one extending to the pelvis where a small ulcerated area was observed. The pelvis is not dilated and part of the attached ureter, measuring six cm. in length is normal. Microscopic description: Section of kidney shows islands of epithelial cells with very little stroma. The neoplastic tissue is characterized by epithelial pearls of various sizes. The individual tumor cells have vesicular nuclei with small nucleoli. The tumor does not originate from the pelvis where an epidermoid carcinoma is possible. The kidney tissue in the section is negative except for dilatation of tubules. Microscopic diagnosis: Metastatic epidermoid carcinoma."

SUMMARY AND CONCLUSIONS

1. Statistical report on a study of 2914 necropsies with an incidence of 13.9 per cent (407 cases) of carcinoma.

2. To the 1481 cases of metastatic renal malignancy reported in the literature we are adding 19 cases found at autopsy and one clinical case.

3. The incidence of renal metastasis was the highest with primary malignancy of the kidney.

4. Clinical cases of metastatic renal malignancy are rare because of the nature of the metastatic lesions.

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The Use of Penicillin in the Management of Chickenpox at the College Age Level*

A Preliminary Report

E. S. Krug, M.D. and H. R. Glenn, M.D.
State College, Pennsylvania

Chickenpox has been recognized for many years as a mild childhood disease generally without any serious complications. The main concern of the attending physician has been to prevent itching with its resultant scarring from scratching, and secondary infection. Cicatricial disfigurement has been of concern especially in girls in the constantly exposed areas of the face, neck, arms and hands.

There has been a relative increase in the number of these diseases seen in the adolescent and early adult periods of life in which most college students are included. The older the individual, generally speaking, the more prolonged and severe clinical picture he presents when suffering from these diseases. Therefore, the treatment of the disease is more serious in college students than in a younger age group.

Because of these considerations, we began in early 1948 to treat our cases of chickenpox with penicillin. We hoped that we would be able, by its use, to reduce the period of convalescence and consequent class room time loss. We also felt that by reducing the secondary infections of the pox lesions as well as the skin irritation and itching, we would be able to materially control any scarring in these people at a period in their lives when personal appearances were of maximum importance.

Unfortunately, we do not have sufficient clinical material to draw any statistical conclusions, but we do feel that we have a sufficient number to indicate to health services and to other interested medical groups that penicillin is useful in the treatment of chickenpox.

In the following chart we have compared the febrile days before and after the use of penicillin in our chickenpox cases. Also, in this chart we have indicated the hospital days involved before and after the penicillin routine. Each solid dot represents a case before the use of penicillin and each circle after the use of this antibiotic.

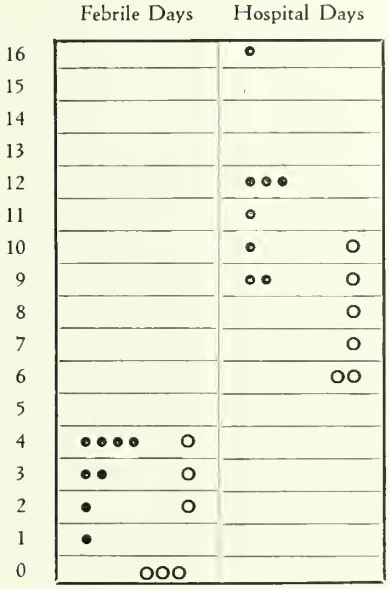

Fig. 1. Chart showing results of using penicillin in chickenpox cases.

Summary

As will be noted from the above comparisons, we feel that we can draw the following conclusions in this small number of cases from the use of penicillin in chickenpox at the late adolescent and early adult age levels.

1. That the average period of fever is reduced by about 50 per cent.

2. That the average hospital days are materially reduced—about 33 per cent as indicated in the chart. This reduction in class time loss is important to college students and fits well into one of the major missions of any health service.

3. Clinically, there was a marked reduction in the itching and a remarkable increase in the comfort of the patient, as well as an absence of scarring in the group.

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*From The College Health Service, The Pennsylvania State College, State College, Pennsylvania.

CANCER FILM AVAILABLE

"Self Examination of the Breast" is the name of a new sound, color, 16 mm. film that has been produced by the Cancer Institute and the American Cancer Society. This film demonstrates how women can and should systematically examine their breasts to detect changes that may be due to early cancer.

The Minnesota Division of the American Cancer Society and the Minnesota Department of Health have prints of the film, and arrangements can be made to show it at county medical society meetings or hospital staff meetings.

Important Factors in the Epidemiology of Tuberculosis

H. A. Burns, M.D.*
Anoka, Minnesota

MUCH has been claimed during the past 80 years relative to the value of various remedial and social measures in the control of tuberculosis. With the organization of State Boards of Health and recognition of the contagiousness of certain bacterial diseases, tuberculosis could not escape being recognized as belonging to the group of diseases depending upon the laboratory for diagnosis and control. The epidemiologist has unfortunately never been assigned the important role in the tuberculosis control program which should be his. The factors limiting his usefulness in this field have been many and varied from time to time, and have usually been due to the introduction of "panaceas" (short-cut methods of examination, immunizing agents, etc., etc.), which promised to solve quickly the entire problem without the laborious work of epidemiologists and other fundamental procedures. Such "panaceas" have always retarded progress in every phase of tuberculosis control. It has been unfortunate throughout the years that this one contagious disease has been the least influenced by epidemiological investigation.

Now with decreasing mortality, morbidity and infection attack rates that can mean the complete control of tuberculosis in America and eradication in some areas within the life span of many of us, we are still being offered "panaceas" as promiscuously as when tuberculosis was of epidemic proportions and when it constituted a major cause of death. Some of the changes affecting the epidemiology of tuberculosis were planned for by individuals or agencies closely associated with and interested in the control of this disease. Others closely associated with the control of tuberculosis were made to apply to the improvement of public health on a state or national scale. Still other measures came about through social changes whose immediate objectives were not concerned in public health, much less the control of any single contagious disease such as tuberculosis. It is apparent that by introducing "panaceas" at any point on a declining graph they may be erroneously interpreted in the future and their use justified by the still further decline of the death rate on the extended graph due to other factors.

It is probable that all efforts to approach the problem of control have had some influence; however, there are certain factors which appeared soon after the period of early decline to be present, that seem to be of permanent significance. The first may well include recognized control methods common in all of the programs of the many agencies and individuals who have worked in this field during the past 60 years. A factor of great importance is the rise in the index of real wages in the United States. The incidence of tuberculosis as a family or community infection changes quite drastically as the value of wages increases. This single element is probably the most potent factor involved in our tuberculosis decline.

The second factor, which to some extent is related to the first, is the complete control of tuberculosis in cattle. Both these factors have covered the period of our decline and both from an epidemiological point of view have made many valuable contributions. Certainly social values which have become an integral part of our way of life in America have given us, according to vital statistics, the lowest incidence of contagious disease in history. Such values must be continued on even higher levels so that we may take advantage of further improvements to our present way of life.

There are few control techniques available that could add further to the decline than have already become a part of our control experience, but it is quite possible that the use of antibiotics will achieve this effect.

Techniques involving the search for tuberculosis in the masses or the protection of the masses through generally applied therapeutic agents are of permanent importance as an essential part of the epidemiological control and early elimination of this disease. Any such technique dependent largely upon creating fear is not founded on experience or known and approved facts. Tuberculosis has been a disease notorious for its record of chronicity with periods of reactivation followed by inactivity with intervals of months or years. Because of this uncertainty in evaluating recovery, the physician has always suffered a severe handicap in his advice to patients in the later days of convalescence. Much has been done to place convalescence on a calendar basis and in no instance have such ideas been wholly satisfactory. One reason for the failure of our late guidance in the treatment of active tuberculosis has been largely due to certain conditions that we well understand but over which at this time we have little control.

The survival of the tubercle bacillus must depend upon its ability to use the respiratory tract as a sinus for the forcible escape of organisms to the outside. All therapy is designed primarily to free the pulmonary discharges of tubercle bacilli. It has been assumed that a negative sputum report is sufficient to determine whether tubercle bacilli do or do not exist in the pulmonary discharges examined. It is further assumed that because of one or more laboratory examinations together with clinical findings that the individual is inactive and no longer a possible danger to others. A study of the use of laboratory methods as applied to tuberculosis control based on sputum leads one to question the accuracy of such conclusions.

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*Former Head, Tuberculosis Control Unit, State of Minnesota Division of Public Institutions. Dr. Burns died July 9, 1949. For biography see "Herbert Arthur Burns, M.D.," by J. A. Myers, M.D., JOURNAL-LANCET, page 122, April, 1950.

The Gaffky count has been used for many years in an attempt to clarify the incidence of organisms discharged daily. The following table shows the number of organisms per field based on this count.

Gaffky I = 1 to 4 bacilli in entire preparation
" II = 1 bacillus to every few oil immersion fields
" III = about 1 bacillus in every field
" IV = 2 or 3 bacilli in every field
" V = 4 to 6 bacilli in every field
" VI = 7 or 8 bacilli in every field
" VII = numerous bacilli in every field
" VIII = still more numerous bacilli in every field
" IX = large numbers of bacilli in every field
" X = enormous uncountable number of bacilli in every field.

The specimen examined must show from one to four bacilli as a result of the examination of the entire specimen to be classed as Gaffky I. This examination must be carefully carried out over a period of at least eight to ten minutes.

The Gaffky I count must at times fail to find many more organisms because the more concentrated fields were missed or that the specimen of sputum from which the slide was made did not include the much higher counts that might have been found if other samples had been examined.

Frequently the laboratory worker examining sputum does not spend over four minutes per specimen before reporting it as negative. Many cases are discharged from sanatoria and from medical observation and follow-up as a result of such reports. Some of those who have reduced the incidence of tubercle bacilli in their discharges have recovered in other ways and because of lessened cough and expectoration there is much less opportunity for dispersal of viable tubercle bacilli to contacts; however, these cases that expel tubercle bacilli at lower levels not recognized by microscopic examination are still virulent and under favorable circumstances may well explain later contact infections.

In a personal communication Sweany said, "We weighed the smear on a slide, estimated the amount of sputum from the weight of dry sputum, determined the number of bacilli per slide, the time it took to examine the slide, and the area of the field. I remember one specimen where one of our able technicians worked for five hours and practically covered the whole slide and found five bacilli. The size of that smear was perhaps not over one-tenth of a cubic centimeter, so in that specimen there were less than 100 bacilli per cubic centimeter. I should say roughly that around 1,000 bacilli per cubic centimeter would be a Gaffky I and a Gaffky II would be many times that amount, perhaps 50,000 or 100,000."

The significant fact is that we are declaring cases ready for reclassification as quiescent, apparently arrested, or arrested and we may even recommend various types of vocational training and re-establishment in the later positive sputum phase of their disease, while we marvel at the tendency of tuberculosis to reactivate and breakdown when we have never been away from the active phase of the disease. There is no advantage from an epidemiological point of view in recommending activities and freedoms to a patient who has had only cursory evaluations of his pulmonary discharges.

Gaffky I is the minimal concentration that becomes of microscopic importance and only then as a result of considerable industry in search for organisms for a period of 10 minutes or longer will one find more than three or four organisms in the whole field. The incidence of tubercle bacilli occurring below the Gaffky I count may be further found through culturing and guinea pig inoculation. However, even these sources, if they could be economically utilized, would not identify all cases that still have acid-fast organisms in their sputa.

It is of utmost importance that the public health laboratory give the epidemiologist much more cooperation and research in the field of tuberculosis control by sputum examination. We have done much to place recovery on a mechanical basis (collapse therapy, sanatorium care and bed rest), but we have accomplished little in determining the time when such mechanical factors might safely be permitted to begin or cease operation. Surely the reduction of organisms below Gaffky I is a public health accomplishment of real importance. The individual may and often does have relapses and spreads which might easily have been prevented if we knew more about his pulmonary discharges in the interim.

In the area between Gaffky I–IV there occurs an average of one bacillus to many fields examined, to an average of two to three per field. The results occurring in this area are frequently disappointing through lack of time spent in the examination or eye fatigue of the examiner. Sometimes through no fault of the examiner such cases fall into the negative group to be correctly evaluated only by culture or inoculation.

The only possibility of determining the complete disappearance of acid-fast organisms must depend at the present time on examinations of pulmonary discharges by culture methods or preferably by guinea pig inoculation under conditions that seriously attempt to determine the bacteriology. As soon as the Gaffky count falls below II, gastric cultures should be substituted for sputum and they should be taken in series of three, two or three days apart at intervals of one or two months.

The total amount of laboratory work must vary but if we are to prepare an effective approach to recovery we must consider the bacteriological examination of the pulmonary discharge of major importance. Because of lack of space and the demands upon the time of the technicians the laboratory has often failed in giving the epidemiologist the data he must have to protect contacts and to guide the patient through the later phases of his tuberculosis to a state of recovery.

When the cultures become consistently negative, guinea pig inoculations should be attempted. Frequently during this period the patient will have an increase in the incidence of organisms following minor respiratory infections. At such times special search should be made for tubercle bacilli. It is only after the sinus tracts have been closed and the organisms have become completely encased that recovery can be assured the patient.

Much effort has been expended in the rehabilitation of the tuberculous under the present standards defining recovery from the disease and eligibility for training. We find much work yet to be accomplished before satisfactory adjudication of these cases may be had. Surely we cannot recommend for post-sanatorium training and rehabilitation cases that we have not every reason to feel no longer have tubercle bacilli in their sputa. The laboratory must give us the necessary routine which in turn must be improved with continued experience upon which to evaluate our tuberculous cases during the later part of their treatment and their preparation for training. If we fail in improving this particular phase of handling the tuberculosis problem we most assuredly will continue to encourage reactivation which is not so much due to the patient as the medical advisor. The epidemiologist must have this factor under control if he is to have a follow-up program of value.

Meet Our Contributors

Robert John Brimi, a graduate of the University of Minnesota, served as pathology resident, Wayne County General Hospital, in Michigan, and as medical fellow, University of Minnesota, now specializes in internal medicine in St. Cloud. He was the recipient of a research grant from National Research Council through the Wayne University College of Medicine and Wayne County General Hospital. He is a member of the Wayne County Medical Society.

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Spencer Franklin Brown was graduated from the University Medical School, received his Ph.D. from the University of Iowa, is now an instructor in pediatrics at the University of Minnesota. He is a member of Alpha Omega Alpha and Sigma Xi.

★

Eric Kent Clarke was graduated from the University of Toronto medical school, took graduate work at the Boston Psychiatric Hospital and the Judge Baker Guidance Clinic in Boston, taught psychiatry at the University of Rochester and the University of Minnesota, was chief psychiatrist at Oak Ridge from 1944 to 1946, now serves as chief of the Minnesota Psychiatric Institute. He is a member of the American Psychiatric Association, county and state medical societies, A.M.A., Minnesota Society of Psychiatry.

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William Fleeson received his medical degree from Yale, took graduate work in child psychiatry at the University of Minnesota, on September 1 begins serving a fellowship at Judge Baker Guidance Clinic in Boston. He is a member of the Orthopsychiatric Association, Northwest Pediatric Society, Hennepin County Medical Society, and the American Psychiatric Association.

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The JOURNAL LANCET

Official Journal of the American College Health Association
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Editorially Speaking

MEDICAL PROGRESS THROUGH RESEARCH

Research is the life-line of progress in every undertaking which has as its objective betterment of the condition of man. Scientific research has opened up new vistas of life and has recreated our entire manner of living. Today, the pauper enjoys luxuries denied kings of half a century age, because of the contributions of science and research to the conveniences of life which most of us are quick to regard as necessities. However much all these gains have improved the condition of man, there is little evidence that they have made him happier. A capacity for happiness is something which each man must cultivate within himself.

Contemplation of the great advances which have come through medical research during the past hundred years suggests that hope and confidence have replaced despair in many diseases. Were it not that an inscrutable aura of ignorance surrounds so many problems in medicine, we might well share a feeling of complacent satisfaction for what has been accomplished. With reference to many illnesses which affect man, there is good reason for rejoicing over what research has accomplished; no one has ever sensed real pleasure who has not, in its enjoyment, experienced a feeling of gratitude. Let us be grateful for what has been done; at the same time our faces must be turned with determination toward the large tasks of bringing light into those areas now pervaded by darkness.

Research in medicine is a field of endeavor which touches the life of every person many times during his journey from the cradle to the grave. Yet there are some among us who affect no interest in medical research; in fact, a few even oppose animal experimentation. The day of hypotheses, postulations, and theories unverified by experimentation in medicine is past. And the only effective manner in which the shackles of speculative rationalization can be severed in the pursuit of biologic knowledge is through the testing of ideas by experimentation upon animals. Medical research has saved more lives than have been lost in all the wars since the beginning of time. When man no longer slays animals for food or clothing or holds them subservient to his will, the significant evidence learned in experiments upon animals will fully justify their performance for the protection and prolongation of human life.

Our legislative body in Minnesota recognized the intimate dependence of medical progress upon medical research in the recent enactment of a law making it possible for educational institutions prosecuting medical research to obtain animals from pounds for purposes of experimentation, where such animals previously were destroyed.

The rise of the University of Minnesota Medical School from mediocrity to recognition as a true center of learning is owing largely to a growing interest in research. Teaching which fails to instill into the minds of young learners the hopeful prospects of research leads to intellectual starvation. It is the function of universities not only to teach what is known but to strive to give accelerated momentum to the enlargement of knowledge. Only since the members of the faculty of this medical school have looked upon this function as an important duty and a privilege has this school grown to full stature, reawakened by the animated and refreshing spirit of research which breathed new and invigorated life into its being.

The fundamental studies on factors underlying growth processes initiated in the department of anatomy in this school more than 30 years ago helped to earn it the reputation of being one of the outstanding faculties of anatomy in the world. The teaching was of a high order, made so in part by the captivating spirit of enthusiasm of teachers intent upon contributing to the patrimony of knowledge. The contagion of that influence broadened the vision and the horizon of the students as well as colleagues in other departments. Today, active research is in progress in every major teaching division of the medical school. Transmitting passively the lifeless body of knowledge of the past to students of succeeding generations is not enough. The leaders in medicine of the future must receive the nurture of stimulating instruction at the hands of teachers whose thinking is being sharpened by active conflict with medical problems, crying out for solution. Students who have had first hand training in this type of discipline learn early to ask: what is the evidence? They are not likely to confound dogmatism with fact or empiricism with proof.

Studies prosecuted in various departments of the medical school upon the nature of fatigue, the heart and the circulation in health as well as in disease, disturbances of respiration, cancer biology, nutritional disorders, metabolism in its broad aspects, endocrine disorders, diseases of the nervous system, fevers and infectious diseases, affections of the kidney, liver and bile passages as well as those of the alimentary tract—such studies have played an integral part in shedding additional light upon many important problems. In many areas still, there is need for more luminous light which will permit clearer vision and a more intelligent comprehension.

Understanding the nature of a difficult problem comes rarely, if ever, all at once. The luminescent flash of a firefly, the dimness of candlelight, and the incandescence of the electric light reflect relative differences in the luminosity of our present understanding of many pressing problems. Persistent fact-gathering through research is the only instrument which can dispel the veil of darkness which obscures our vision and defies our understanding of perplexing medical enigmas. Institutions which count among their faculties ardent seekers after

(Continued on page 310)

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light—such institutions will be bringers of the light. In universities, where the lamp of learning burns brightly, and the fervor of enthusiastic interest at the forge of its workers does not go out—such institutions irradiate an influence which brightens the lives of all who live within its shadow. Into the lives of those who become completely absorbed in its work and life, a flame is lit, which like the after-glow of sunset in the western sky brings brief light again to a dying day. And long after the feverish activity of such participation is past, the memory is easily stirred to recollection of pleasant labors, which can bring comfort and joy into distant cheerless days.

Research exerts a catalytic effect upon the growth of knowledge; in no small measure that result is owing in part to the side chain reactions of an augmented student interest and the enlarged perspective of an institution, sensitive and alert to its responsibilities. The people of Minnesota has an important stake in its institutions. Let us, who enjoy the opportunity which their struggles and wise planning have provided, strive to have our institutions merit the great pride with which the democratic people of Minnesota regard them.

The faculty of the Medical School, mindful of its great trust, is endeavoring to justify the faith of the people of Minnesota in their assurance that medical research brings better medicine to them and added luster to their Medical School and University.

Ten years ago, on the occasion of the celebration of the fiftieth anniversary of the founding of the Medical School, the Minnesota Medical Foundation was organized by members of the Medical Alumni Association in the firm belief that the future of the school was linked directly with the character of the support given medical research, within and without the walls of the University. With the years, that belief has crystallized into conviction. As long as research is regarded by the faculty as one of its important functions, the future of the medical school of the University of Minnesota is secure. In the final analysis, adequate support of research becomes the responsibility of those who are the recipients of its benefactions. Medical research has returned usurious dividends to society. We can well afford to support it generously.

Owen H. Wangensteen, M.D.,
Department of Surgery, University of
Minnesota Medical School.

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How to keep your instruments from rusting. Iron and steel goods of all descriptions are kept free from rust in the following manner: Dissolve ¼ ounce of camphor in 1 lb. of lard; take off the skum, and mix as much black lead as will give the mixture an iron color. Iron and steel goods, as well as machinery of all kinds, rubbed over with this mixture, and left with it on for twenty-four hours, and then rubbed with a linen cloth, will keep clean for months.—*Northwestern Medical and Surgical Journal (Journal-Lancet)* 1:21, 1870.

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A. C. H. A. News

The University of Florida has a vacancy for a Director of Student Health. The infirmary is a modern, well-equipped unit of seventy-five beds with a nurse's home attached. The student body numbers approximately ten thousand, with about ninety per cent male students. Contact Dean D. K. Stanley, University of Florida, Gainesville, Florida, for further information.

* * *

Dr. George T. Wilhelm has resigned from his position at the University of Tennessee Hospital and Clinic at Knoxville because of illness. Dr. A. F. Miller has become the Acting Director.

* * *

The University of Tennessee needs two full-time student health physicians for hospital and clinic work. Preference will be given to male physicians, although consideration will also be given to one woman. For further information write to Dr. A. F. Miller, Acting Director, The University of Tennessee Hospital, Knoxville, Tennessee.

* * *

Dr. Hilde M. Siering, resident physician, Russell Sage College, Troy, New York, is looking for a resident nurse. The college has an enrollment of about 450 dormitory students. The salary is $1,900, including room and board.

* * *

Dr. C. D. Gossage, Director of University Health Service, University of Toronto, has resigned to accept a position as Assistant Medical Director for the Confederation Life Association.

* * *

The Michigan Section has elected Mr. Melbourne Murphy as its new president. The other officers are: Gayle Pond, R.N., secretary-treasurer, and Dr. V. L. Van Duzen, vice-president.

* * *

We are happy to announce that the application for membership of Cottey Junior College, Nevada, Missouri, has been approved by the Executive Committee. Miss Carin H. Degermark is the Health Director of the student health service. The final acceptance for membership in the Association will be by approval of the membership at the next annual meeting.

Notices

The University of Minnesota announces a continuation course in *neurologic roentgenology* to be held at the Center for Continuation Study on October 30 to November 5, 1950. Faculty members include Drs. Arthur E. Childe, Winnipeg; Philip J. Hodes, Philadelphia; Dabney Kerr, Iowa City; and Knut Lingbrlom, Stockholm, Sweden.

Female and male fertility will be the subject of a University continuation course on September 28 to 30, intended for physicians specializing in obstetrics and gynecology. Visiting faculty members include Dr. Warren O. Nelson, University of Iowa College of Medicine; Dr. Isador C. Rubin, Mount Sinai Hospital and New York University College of Medicine; and Dr. Fred A. Simmons, Harvard University Medical School.

The JOURNAL LANCET

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PREPARATION OF MANUSCRIPTS

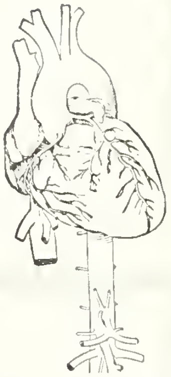
JOURNAL-LANCET extends an invitation to the profession for articles with the understanding that they are original contributions not previously published.

Manuscripts are to be typed on one side of the paper, double spaced. Illustrations must be in the form of glossy prints or drawings in black ink. Statistical tables and charts should be set up according to the style used in this journal and should be presented on separate sheets rather than within the text material. Please do not attach legends to the pictures. A reasonable number (two or three) illustrations are published free of cost; special arrangements must be made for more numerous or highly finished illustrations or tables.

Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

Copyright 1950 by Lancet Publications, Inc.,

Publication Office, 501 Essex Building, 84 So. 10th St., Minneapolis 3, Minn.
Entered as second-class matter at the postoffice at Minneapolis under the act of March 3, 1879.
Published monthly. Single Copies 35c. One Year $3



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The JOURNAL LANCET

Minneapolis, Minnesota
September, 1950

Vol. LXX, No. 9
New Series

Some Common Medical Emergencies and Their Treatment*

Robert B. Radl, M.D.†
Bismarck, North Dakota

One good definition of a medical emergency is that of a sudden medical condition requiring immediate action. Limitations of space require that the diseases to be discussed be restricted in number and I have chosen conditions which are quite common and are definitely of an emergency nature.

For the purposes of this paper, I am assuming that the correct diagnosis has been made of each of the diseases or conditions under discussion and there will be but little regarding diagnosis or differential diagnosis.

Status Asthmaticus

This has been described as a period of intense dyspnea which lasts from a few days to a week and is caused by an outpouring of viscid mucus from the bronchioles, resulting in a serious loss of lung capacity with great impairment of respiratory function. There is often, but not necessarily, little or no response to epinephrine or aminophylline. Death results more commonly in this type of asthma than in the acute bronchial or the chronic or intractable types. Whether the asthma is considered to be on an allergic or non-allergic basis, steps should be instituted to treat it as though an allergic factor were present. The patient's room (preferably in a hospital) should be as bare as possible and all bed clothes should be of non-allergenic material or in plastic coverings. Anything to which the patient is known to be allergic is, of course, to be avoided.

Symptomatic treatment is aimed at keeping the air passages opened and liquefying bronchial secretions. While it often appears that these patients are epinephrine-fast, the administration of larger doses of epinephrine at more frequent intervals may give results. Epinephrin intravenously in a 0.1 cc. dose diluted in a small amount of isotonic sodium chloride solution may be tried once; if this fails to relieve the patient, epinephrine administration should be discontinued entirely.

Aminophylline should always be given a trial. It is best to try 3¾ grains of aminophylline intravenously, a dosage which may be repeated, or 7½ grains dissolved in 1000 cc. of 5 per cent glucose, given intravenously. Such a preparation will give sufficient fluid at the same time. Aminophylline given orally does not seem to help a great deal in these severe cases, but may be of value in rectal suppository form. Remember that the effect of aminophylline is that of a bronchodilator.

Iodine is probably one of the best drugs for liquefying bronchial secretions. It may be given orally as a saturated solution of potassium iodide in doses up to 12 to 30 minims three times daily, or as sodium iodide one gram given intravenously without dilution or added to a liter of glucose and distilled water.

---

*Read before the Annual Session of the North Dakota State Medical Association, May 29, 1950, Grand Forks.

†From the Department of Internal Medicine, Quain and Ramstad Clinic, Bismarck, North Dakota.

Antihistaminic drugs are definitely indicated, but which one or ones are to be used of the many different drugs on the market? A good answer to the question, I believe, can be found in the article, "Antihistaminic Drugs," by Sternberg, Perry, and Levan in the April 1, 1950, Volume 142, Number 13, issue of the *Journal of the American Medical Association.*

The patient in status asthmaticus is usually physically tired and often frightened and needs physical and mental rest. Barbiturates in fairly small doses may accomplish this and chloral hydrate by mouth or rectum may be of help. Most authorities believe that morphine is definitely contra-indicated and may result in death due to its depression reaction on the respiratory center with increase of bronchial spasm in some cases. I believe that morphine or comparable drugs, such as dilaudid and pantopan, are definitely contra-indicated in any case of bronchial asthma of any type of severity. Demerol, on the other hand, in doses of 50 milligrams or 100 milligrams, is probably not as dangerous as morphine and tends to give bronchial relaxation. An old standby, which gives remarkable results in some cases, is the use of ether in oil in equal proportions given rectally in a dosage of one ounce of the mixture to 20 pounds of body weight. Another good medication is an emetic dose of ipecac. There are many other medications which have their firm adherents.

Fluids are required and, if facilities are available, detailed laboratory studies of the electrolyte balance should be made with attempts to bring the blood chemistry as close to normal as possible. Three to five liters of fluid daily, by the intravenous route if necessary, and preferably in distilled water, apparently does not increase the bronchial secretions.

If infection is not the cause in the particular case of status asthmaticus, it is probably present at least to some degree. Therefore, antibiotics such as penicillin, and other antibiotics, given orally, subcutaneously, or by aerosol method, are to be used. Since there is no specific in these cases every weapon at hand should be employed.

Even if cyanosis is not present, oxygen is indicated. Usually masks are not suitable for continuous use of oxygen by patients with dyspnea. The best way to give it is by use of an oxygen tent or a nasal catheter with a flow of five to seven liters per minute, which will maintain from 35 to 50 per cent of oxygen in the inspired air. A mixture of oxygen and helium, as suggested by Barach, is probably more efficient than oxygen alone, but is often not available.

Bronchoscopic aspiration, if available, may be lifesaving. It is a major procedure in cases of status asthmaticus, but it may be the only thing that will help.

There are many other preparations which give good results in some cases. Ephedrine used alone or with synergistic drugs often helps. Isuprel in the form of an inhalant or sublingually gives results in some cases. ACTH is of great value, but at this date is not generally available.

CORONARY OCCLUSION

The underlying condition here is myocardial ischemia which results from a partial or complete occlusion of one of the coronary arteries or one of their branches. The immediate treatment consists of the adoption of all methods designed to reduce the work of the myocardium to the absolute minimum. Mental rest is also extremely important. The use of the bed pan and the urinal is to be urged, but actually the use of the bed pan may require more physical exertion than the use of a commode arranged near the bed.

Morphine is the drug of choice and is of great value because it relieves the agonizing pain which usually accompanies the occlusion, and it reduces the patient's oxygen demand. One often hears the statement that sufficient morphine should be given to control the pain and if ¼ grain subcutaneously does not relieve the pain rather promptly, another ¼ grain should be given subcutaneously. Since this may, however, depress the respiratory center too much, I urge careful consideration as to the amount of morphine and the frequency with which it is given. Consider the use of morphine intravenously. The pain is relieved almost immediately and there is less tendency to overdose the patient. One-quarter grain can be given slowly over a period of three to five minutes intravenously in about five cc. of saline or distilled water. Often that size syringe is not available, but the two cc. syringe can be used by giving approximately half of the dosage subcutaneously and the other half intravenously, diluting the contents of the syringe by withdrawing blood into the syringe at frequent intervals during the injection.

Often morphine will have to be repeated, depending upon the degree and severity of pain, but it must be used within physiologic limits. The barbiturates do not relieve pain, but they do help to relieve the apprehension which is so common in this disease picture. They may, of course, be given orally, subcutaneously and certain preparations, intravenously.

Opinions differ as to the value of aminophylline as a vasodilator drug. Experiments seem to show that the blood flow through the *normal* coronary arteries in animals is increased up to 100 per cent when the drug is given intravenously. This may not, of course, apply to diseased coronary arteries, or even in normal coronary arteries, in the human. If aminophylline is used, it should be given in doses of 3¾ grains intravenously, but very slowly, as otherwise a dangerous drop in blood pressure may ensue. This, of course, is to be avoided, since a drop in blood pressure may have already occurred as result of the acute coronary disease itself.

Papaverine hydrochloride may be used in one grain dose, injected slowly intravenously. But if to be used, I recommend that it be given subcutaneously every four hours or orally in doses of 1½ grains every four to six hours. It is said to have an antispasmodic action on the coronary arteries, but apparently does not have much analgesic effect.

Atropine sulphate is of value to counteract the action of the vagus which induces reflex spasm in the other coronary vessels, but atropine is contra-indicated if the heart rate is rapid.

There is, likewise, disagreement as to the use of quinidine sulphate to prevent ventricular fibrillation. It may be indicated especially in the patient with a high pulse rate. The patient with coronary thrombosis can usually take liberal doses of quinidine sulphate and if there is no reaction to the first test dose, a dosage of three grains every four or five hours in the course of the first fourteen days can often be well tolerated. In my opinion, quinidine sulphate is not to be used routinely.

Digitalis is usually not indicated unless there are signs of congestive failure which, in themselves, would indicate the use of digitalis or purified preparations. It is true, however, that some cases of coronary thrombosis are associated with, or followed by, severe congestive heart failure and then, of course, digitalis may be required with other measures for the treatment of that condition.

More and more physicians are using anticoagulant therapy, especially dicumarol, starting usually with 300 milligrams the first day, 200 milligrams the second day, and usually 100 milligrams the third day, the dosage depending upon daily prothrombin times. We feel that a rate of around 25 per cent is satisfactory. Heparin is now available in a slow, absorbing medium and from a logical point of view, it would appear that it should be given immediately until dicumarol has had sufficient time to begin its effect. Recent studies indicate that possibly heparin and dicumarol have a coronary vasodilator effect also. I am a firm believer in anticoagulant therapy, but I caution against the use of anticoagulant drugs outside of a hospital and even there, unless there are facilities to carefully check the anticoagulant effects daily. Even under such conditions, these drugs are not entirely free from danger.

The use of oxygen as discussed in the treatment of status asthmaticus is indicated in an attack of any severity whatsoever. The duration of administration of oxygen depends upon the case, but I believe the routine, continuous administration for at least three or four days is imperative.

Paroxysmal Cardiac Dyspnea

This symptom of left ventricular failure, often called cardiac asthma and often nocturnal in occurrence, is one of the most terrifying conditions to a patient. It really is a combination, as a rule, of severe dyspnea with pulmonary edema. The therapy in general is that for left ventricular failure, but one must individualize each case. Patients tend to be more comfortable in a sitting position and often they prefer to sit in a chair rather than to be in bed. Morphine, usually satisfactory when given subcutaneously, is the best drug for immediate help. With acute, overwhelming pulmonary edema, oxygen is necessary. Venesection, taking off as much as 700 cc. rapidly by means of the use of a large needle or even bleeding from more than one extremity at a time, may be necessary to save life. Aminophylline intravenously in 7½ grains dosage is often effective.

If the patient has not been previously digitalized, digitalization is definitely indicated and should be started promptly with large doses of the digitoxin preparations.

Paroxysmal Tachycardia

The most common type is auricular tachycardia and it usually occurs in hearts that appear to have been normal before the attack and to be normal after the attack. Ventricular tachycardia is comparatively uncommon and usually occurs in patients with serious heart disease. If prolonged, it may throw the heart into decompensation. It can be seen, therefore, that the significance of prognosis in a case of paroxysmal tachycardia depends upon the underlying condition of the heart. The electrocardiogram is the most exact means of differentiating auricular tachycardia, ventricular tachycardia or other conditions of an allied nature. Some paroxysms of tachycardia last comparatively long but occur infrequently, possibly every number of months. In other cases the paroxysms are of very short duration but occur frequently. Possible predisposing influences, such as emotional upsets, nicotine, caffeine, should be considered in the management of any case.

The treatment in the acute attack usually aims at the same objective, which is stimulation of the vagus. It is said that vagus stimulation has no effect in ventricular tachycardia, but in the case at hand the physician often is unable to determine the exact origin of the tachycardia and he will attempt mechanical stimulation of the vagus. This can be accomplished by pressure over the eyeballs or over the carotid sinus. Pressure should be applied over one carotid sinus at a time and, if unsuccessful on the one side, then pressure should be applied to the other side. Pressure should be stopped promptly, if the pulse rate returns to normal.

One of the first drugs to use is syrup of ipecac in an emetic dose, usually eight cc. orally, which stimulates the vagus indirectly. If neither vomiting nor the desired effect follows, the dose may be repeated in about one hour. Morphine is usually not of value. Atropine is contraindicated, since atropine tends to release the effect of the vagus. Barbiturates or large doses of bromides may be of value, however.

Quinidine sulphate is of great value, and can be given in divided doses up to 30 grains in twenty-four hours, if a small test dose does not reveal contraindications to its use. It is best to start out with smaller doses; a dosage of 30 grains in twenty-four hours should not be given for more than one day.

There is some disagreement as to the use of digitalis preparations, but actually they often terminate an attack. Some authorities consider digitalis dangerous and contraindicated in ventricular tachycardia. These same authorities state that quinidine sulphate is the drug of choice there, that digitalis is indicated in the auricular tachycardia, but only one-half to three-fourths of an average digitalizing dosage is necessary.

Mecholyl is a powerful parasympathetic stimulant, and thus stimulates vagus stimulation. It is said to be very effective in auricular tachycardia, but I have not used it because of its side effects. It may be necessary, but if it is used, atropine should always be available to counteract these side effects.

Diabetic Acidosis or Coma

In cases of previously diagnosed diabetes mellitus, it is estimated that one-half of the cases of coma are due to neglect of the prescribed measures for management of the diabetes, one-third are due to the presence of infection, and the remainder are due to trauma, surgical operations, vascular accidents, gastro-intestinal upsets, etc. The prognosis in coma becomes worse with increasing age, duration and depth of the coma, the presence of infection, and abnormalities of the heart and kidneys. It is apparent, therefore, that diabetic acidosis and coma are frequently diabetic acidosis plus something else, and this something else must be treated as well as the diabetes. We shall discuss the treatment of the diabetic condition only, however.

Insulin is the sheet anchor of treatment, but it is not all. Good nursing care, preferably in a hospital which has facilities for frequent urine examinations and laboratory facilities, at least for blood sugar determinations, helps a great deal. The carbon dioxide combining power determination at the onset, if available, is of value. Gastric lavage at the onset, especially in those cases with general abdominal pain and with leukocytosis, will often prepare the gastro-intestinal tract for earlier reception of food and liquids. It is probably best not to catheterize, unless absolutely necessary, to obtain urine specimens.

Dehydration is one of the striking clinical features, and no doubt one of the factors of the disturbed physiology at the basis of acidosis and coma. The only answer to the question of how much fluid to give is "enough." One, two, or three liters a day ar minimal, and while in the severe stage of acidosis, saline is best given. Even six, seven, and eight liters may be necessary.

There is question and disagreement on the subject of giving glucose, but I feel that glucose is not necessary with a very high blood sugar, and give glucose intravenously or subcutaneously only if the blood sugar is fairly low—for diabetic acidosis that is, say about 200 milligrams per cent. At the same time, I realize that the patient does not die of hyperglycemia, but dies of ketosis.

The insulin to be used should be regular insulin. The dosage must, of course, be varied to suit each case, taking into account the age of the patient, degree of acidosis, and amounts of insulin administered previously, if any. The important thing is to give enough insulin within the first few hours of treatment. The average initial dose for the adult is from 40 to 60 to 100 units subcutaneoulsy, or part of it may be given with fluids which are being given intravenously. However, intravenous insulin acts only as long as the fluid in which it is given. Joslin and his group report that the average insulin given in the first three hours was 210 units of regular insulin. The urine should be tested at least every three hours, and preferably every two hours, and insulin given as needed. Remember that the aim is to rid the body of ketone bodies, and the easiest method to determine their absence or presence is by testing the urine for acetone and diacetic acid. Much larger amounts of insulin are required in the presence of acetone and diacetic acid than in cases where the urine shows sugar, but is free of the ketone bodies. If an initial gastric lavage is performed, it is well to instill several hundred cubic centimeters of bicarbonate solution. Some of you will remember that in the pre-insulin days it was a common practice to give alkalies intravenously and routinely, and it is still a good procedure in a severe case. Five hundred cubic centimeters of a five per cent solution of sodium bicarbonate may be given intravenously or isotonic one-sixth molar sodium lactate may be used.

The patient with diabetic coma must be watched very carefully, and gradually brought back and placed on general diabetic management.

The question of circulatory stimulants is often brought up, but they are actually not needed for treatment of the diabetic coma itself, unless they are indicated for treatment of one of the complications or other diseased conditions present.

Acute Gastro-Intestinal Hemorrhage

The causes of acute severe hemorrhage in the digestive tract may be listed in order of importance as follows: (1) duodenal ulcer, far in the lead; (2) gastric ulcer; (3) gastric carcinoma; (4) esophageal varices; (5) Meckel's diverticulum; (6) benign tumors of the intestinal wall; and (7) right-sided colonic cancer, which usually does not cause very severe acute hemorrhage, however.

Something must be said here as to diagnosis of the underlying condition. If the case in question has been studied previously and a diagnosis has been made, that, of course, helps a great deal. However, diagnostic assumptions often can be made at the time the patient is seen in a state of hemorrhage—based on history, age, and various diagnostic points. It is to be remembered that hemorrhage from duodenal ulcer often occurs in a so-called "silent" duodenal ulcer where the patient has had no symptoms of an ulcer previously.

The objectives of treatment of hemorrhage, whatever the source, are mainly three: (1) replacement of blood volume; (2) stopping of the hemorrhage at its site; and (3) sedation of the patient. How does one determine if bleeding persists? Persistent vomiting of blood is usually a sign of active bleeding, but blood in the stools is not necessarily a sign of active bleeding, since the blood may be from previous hemorrhage. Faintness, dizziness, perspiration, weakness, thirst, pallor, especially if such symptoms persist, indicate persistent bleeding. Repeated frequent hemoglobin and red blood count determinations are of value, but may be influenced somewhat by dehydration. Probably the best clinical index is frequent blood pressure readings, say every hour, and taking the pulse rate every hour. Such careful watching is necessary whatever the source of the bleeding. Elevation of the blood urea occurs frequently due to increased urea production from digestion of the blood and also because of kidney damage resulting from dehydration and lowered blood pressure.

Treatment of the condition depends primarily on the severity of the hemorrhage and secondarily upon the site of the hemorrhage. The best agent to replace blood is whole blood by transfusion. Plasma, intravenous glucose, and saline are good as emergency substitutes or as adjuncts to blood. How much blood should be given and what are the indications for it? If blood is available for transfusion, I believe that one should not wait until the patient is in a shock-like state. Any one or a combination of the following are indications for transfusion: (1) a blood pressure of 100 mm. or less; (2) a pulse rate of 120 or more; (3) a hemoglobin of 55 per cent. How much blood should be given? Five hundred cubic centimeters should be given in the first transfusion and actually, if available, sufficient blood to replace continued blood loss. Rest of the affected organ, and general physical and mental rest are needed, and most physicians feel that morphine given often enough gives the best results. The various types of barbiturates may also help. There is much disagreement as to food and liquid by mouth in case of hemorrhage. In my experience, food and liquid, except for ice chips will not be tolerated, and they do harm, if hemorrhage persists of any severity. I believe a Sippy type of diet should be started in small amounts as soon as the total sum of evidence indicates that hemorrhage has ceased or is minimal. I have not used gastric washings at any time.

Atropine by hypodermic injection at six or eight hour intervals in doses of grains 1/120 to grains 1/150 are indicated, I believe. Aluminum hydroxide gels in approximately two drams every hour or by continuous nasogastric drip in the amount of 33⅓ per cent suspension at 15 drops a minute are indicated. Vitamin K, parenterally, and also vitamin C, which also can be given hypodermically, I believe are indicated as an adjunct even though the prothrombin time may be normal and even though there may have been no evidence of lack of these vitamins.

An ice bag applied locally to the epigastrium is a time-honored procedure, and may be of value by reflex mechanisms.

There is much disagreement on the question of surgical intervention. It does appear, however, that death does not follow an initial hemorrhage, but results from sucessive hemorrhages over a period of a few days. It further appears, therefore, that even with evidence of a very severe hemorrhage, surgery is not the first step, but is to be considered when good medical measures are not controlling the situation. Since duodenal ulcer and gastric ulcer are the two leading causes of severe gastrointestinal hemorrhage, the question of surgical intervention should be directed especially at those two conditions.

Our radiologists tell me that careful x-ray studies of the stomach and duodenum can be made in the case of hemorrhage without untoward effect on the patient. As a matter of fact, it appears that the introduction of the barium substance may have helped stop the hemorrhage in one case. The exact site of the hemorrhage, if it can be diagnosed preoperatively, is of great value to the surgeon. The age of the patient, coexistent arteriosclerosis, and other associated diseases are factors to be considered as to whether the patient should go to surgery. Surgery for a bleeding duodenal ulcer in an elderly individual tends to be more dangerous than in a young person, because of the sclerotic vessels which are probably present. In the case of an eroded and ruptured gastroduodenal artery or the pancreaticoduodenal artery on the posterior wall of the duodenum, which are notoriously likely to bleed persistently, early surgical intervention may be required to save life.

The decision to operate is always a difficult one, and unfortunately it often is made too late. Surgery, if it is to be done, should be within the first forty-eight to seventy-two hours after the onset of hemorrhage, since the mortality rate rises dangerously after this period. As a matter of fact, it is dangerous enough even in this period. Actually, surgery in these cases is not a simple procedure, since the patient is a poor risk and simple ligation of the bleeding points may be difficult and may not be entirely satisfactory. Resection of the bleeding part is often necessary.

Conclusions

There are many other conditions of an emergency nature, notably acute poisonings due to various drugs and agents, but the limitation of space does not permit the inclusion of any other subjects. I believe that you will agree that the subjects discussed are definitely emergencies.

RED CROSS ACCEPTS JOHNSON REQUEST TO COLLECT BLOOD

General George C. Marshall, president of the American Red Cross, has accepted a request by Secretary of Defense Louis Johnson that the Red Cross become the official agency for the procurement of blood for the armed forces when such blood and its derivatives are needed.

At present 34 regional blood centers and 46 mobile units are in operation collecting approximately 63,200 pints of blood a month for civilian use. Regional blood centers in the upper Midwest are those at St. Paul, Minnesota; Madison, Wisconsin; and Great Falls, Montana.

Management of Arteriosclerosis Obliterans in Cold Climates

Graham A. Kernwein, M.D.*
Minot, North Dakota

Pain in the legs or feet is a frequent complaint among persons consulting an orthopedist. One of the commoner causes of this symptom is occlusive arterial disease, and of the various types of occlusive arterial disease, arteriosclerosis is clinically the most important.

Arteriosclerosis obliterans is defined as that type of arteriosclerosis that occurs in the extremities. As the arteries of the upper extremities rarely are involved with this disease, discussion will be limited to the condition as it is encountered in the lower extremities.

The incidence of arteriosclerosis obliterans is higher than is generally recognized. (Table I.)[1]

Table I

Age and Sex Incidence of Arteriosclerosis Obliterans

Age	Men	Women
40 to 49	27%	8%
50 to 59	55%	26%
60 or over	77%	56%

A condition so prevalent as to affect 25 per cent of the women and 55 per cent of the men over 50 years of age warrants careful consideration. Particularly is this true in cold climates as persons afflicted with arteriosclerosis obliterans are unusually susceptible to frost-bite. In North Dakota, with the advent of winter and concomitant exposure in inclement weather, persons with occlusive arterial disease should take special precautions. A review of the present day concepts of arteriosclerosis obliterans therefore should prove of general interest.

There are two types of obliterating vascular lesions, the organic and the functional. Arteriosclerosis obliterans is an organic type of obstruction of which three components are recognized, changes in the media, atheroma and thrombosis. Of these, the earliest to appear and clinically the most important is the atheroma. It is the slightly elevated plaque or streak so frequently seen on the intima surface. Its importance lies in its inherent ability to increase in size, thus obstructing the lumen, and also in the tendency of thrombi to originate on the surface. These thrombi may completely or partially occlude the lumen of the vessel. Vascular obstruction so produced accordingly may be sudden or gradual. Symptoms vary with the rapidity of development of occlusion, the level at which occlusion occurs, and the extent to which obstruction involves the potential collateral circulation. The actual obstruction usually involves the large arteries of the lower extremities such as the iliac, femoral, or popliteal. Obstruction usually is so gradual that circulatory adjustments are made. Clinically the course is characterized by a gradually progressive or episodal obstruction of the main arterial lumen.

The prime function of an artery is to transport nourishment to the tissues. So long as it performs this function, the lumen is considered adequate. This is relative, however, for an arterial lumen may be adequate to provide nourishment to the extremity when at rest and inadequate for sustained muscular activity. Leg cramp or stiffness that develops with muscular activity and disappears promptly with rest is the first symptom of which most afflicted persons complain. They accommodate by slowing their rate of activity and reducing it in amount. Pain that originates while lying in bed and is relieved by a dependent position also is a frequent complaint. This condition is due to a sagging mattress which causes an elevation of the feet.

The symptoms of arteriosclerosis obliterans are those of obstruction of the arterial flow. Distal to the obstruction, the pulse is absent or diminished, the blood pressure is reduced and the rate of blood flow slowed. Elevation of the foot produces a disproportionate blanching of the skin because the blood pressure, vis a tergo, is insufficient to compete with gravity. Placing the previously elevated foot in a dependent position reveals a delay in the return of color and prolongation of the venous filling time. These changes are pathognomonic of organic obstruction. The time required for the return of color to the skin of an extremity elevated for two minutes and then placed in a dependent position gives a roughly quantitative evaluation of the adequacy of the circulation. In an extremity with a normal circulation, color will return to the skin in ten seconds or less. A delay of fifteen seconds indicates a mild obstruction. Thirty to forty-five seconds is indicative of a moderate obstruction and when a delay of forty-five seconds or more exists obstruction can be considered severe.

A second less important function of an artery and one upon which numerous clinical tests are based is the maintenance of skin temperature. Reduction of blood flow cools the skin; increase in the blood flow warms it. The actual control of skin temperature is influenced greatly by environment. Cold acts locally and directly as well as systemically and reflexly to produce vasoconstriction and functional obstruction of the vessels. Emotional stress and smoking also may produce functional obstruction by vasoconstriction. Such a functional obstruction, unimportant to an extremity with an adequate circulation, may result in marked tissue damage when superimposed upon a circulation embarrassed by organic obstruction.

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*Section of Orthopædic Surgery, Northwest Clinic, Minot, North Dakota.

Surgery of the sympathetic nervous system has improved the prognosis and altered the concepts of treatment of arteriosclerosis obliterans. The fatalistic concept of arteriosclerosis obliterans that in many places still prevails is expressed by the following quotation from Moschovitz,[2] "Arteriosclerosis is the inevitable destiny of all creatures who possess a cardiovascular system with intravascular pressure. It is an inevitable consequence of aging and therefore irreversible. Unless the person is cut down by intercurrent disease, death invariably is the result of arteriosclerosis . . . it is hardly likely any method of treatment ever will be discovered that will restore diseased vessels to normal texture unless we can cure mortality . . . "

Moschovitz' concepts can be correct and still not eliminate the possibility of improving a markedly embarrassed circulation in an extremity. The possibility of improving the collateral circulation remains. One must agree there is no known method of reopening the lumen of a vessel occluded by the pathological processes of arteriosclerosis obliterans. The obliterative obstruction usually occurs in the large vessels such as the iliac, femoral, or popliteal. The collaterals and peripheral arterioles often are remarkably free from any organic obstruction. Elimination of functional obstruction (spasm) by novocaine block of the paravertebral sympathetic ganglia will result in marked improvement in the circulation. This improvement may be evidenced by any or all of the following: flushing of the skin, increase in skin temperature, diminution of pain and increase in the capacity of the muscles to do work without the pain of intermittent claudication. Even in the absence of any of these signs of improvement following novocaine block, surgical extirpation of the lumbar ganglia may be followed by marked clinical improvement. This improvement may persist so long that some intercurrent disease may be the cause of death.

Brevity precludes a report of individual cases. A single case report will suffice to demonstrate the policy followed at the Northwest Clinic.

A white male 64 years of age presented himself complaining of pain in his left leg. This pain appeared after walking about one and one-half blocks and promptly disappeared with rest. There were no similar complaints relative to the right leg. The patient also had noticed that about five o'clock in the morning he was awakened with pain in his left foot. This pain disappeared when the patient dropped his foot over the side of his bed. Also, for about six months, he had experienced great difficulty keeping his feet warm and had begun to wear socks to bed.

The past history revealed that three years previously an adenocarcinoma had been found in a prostate removed from the patient. There was no evidence of recurrence as evaluated with x-rays of the skeleton, acid phosphate studies, and examination of the prostate bed. The only other relevant finding was the history of smoking 40 cigarettes daily for many years.

Examination of the extremities revealed palpable arterial pulses throughout the right lower extremity. The dorsalis pedis and posterior tibial pulses were absent on the left. Thermocouple studies revealed a difference of four degrees in the skin temperature of the two feet. Elevation of the feet to 70 degrees caused some blanching of the skin of both feet, but was most marked on the left. When placed in the dependent position, the color returned on the right in 22 seconds and on the left in 45 seconds. The venous filling time on the right was 20 seconds and on the left 43 seconds.

These findings indicate that this individual was suffering from an organic obstruction of the vessels of both feet but more marked on the left. The unilateral coolness, intermittent claudication, absence of arterial pulses, delay in venous filling time, delay in return of color and blanching with elevation could be due only to an organic obstruction.

In order to evaluate the question of a superimposed functional obstruction the patient was given a work test. He was asked to walk rapidly until the intermittent claudication appeared. This was found to be a distance of one and one-half blocks, when pain appeared in the left calf. A left lumbar paravertebral block then was performed. The skin temperature of the left foot rose five degrees; the oscillometric readings were unaffected. Then the patient was asked to walk again. After walking eleven blocks, he had to stop because of pain in the calf of his previously asymptomatic, right leg. The previously symptomatic left leg remained pain free.

Accordingly, with this excellent demonstration of the presence of a very marked functional obstruction, lumbar sympathectomy was considered indicated. A left lumbar sympathectomy was accomplished; the first, second, and third lumbar ganglia were removed. Following this, all pain in the left leg disappeared. The patient was able to discontinue wearing a sock to bed on his left foot, but he continued to use one on his right. He developed a postoperative phlebothrombosis bilaterally which responded to anticoagulant therapy.

No such dramatic response is necessary before a clinical improvement may be expected. Although little or no response to novocaine block occurs, marked benefit has been found to result so frequently following lumbar sympathectomy that many persons do them rather indiscriminately. This, however, is unjustified as in some instances gangrene has been thought to be produced by the sympathectomy despite the fact that the foot became definitely warmer. This paradox never has been satisfactorily explained.

Much remains to be learned about the relationship of the sympathetic nervous system to arteriosclerosis obliterans. Time and experience will bring improvements. In the meantime, surgery is offering hope and relief from distressing symptoms to many individuals who formerly were treated with amputation, or were miserable with pain, or who died of intercurrent infection.

Prophylactic treatment should be given all persons over 50. This should include warning against exposure to cold, the practice of careful hygiene of the feet, and the wearing of light wool socks without darns. When cutting the toenails or picking at the paronychial tissues, care must be taken not to infect themselves. All persons over 50 years of age with frost-bite should be very carefully examined for evidence of arterial obstruction. Subsequent care should be tempered in the light of the findings. Remember that to elevate, constrict or over-cool feet in which the circulation is embarrassed as a result of arteriosclerosis obliterans may be so detrimental that an otherwise judiciously handled minor circulatory disturbance will result in an amputation and a major calamity.

References

1. Wright, Irving S., M.D.: Vascular Diseases in Clinical Practice, p. 99. Chicago: The Year Book Publishers, 1948.

2. Moschovitz, E.: Vascular Sclerosis. New York: Oxford University Press, 1942.

American College Health Association News

LETTER FROM THE PRESIDENT

Greetings to all members of the American
College Health Association:

It seems well that upon the beginning of another school year the president should report to you on the activities of his office and on those of the other officers involved in conducting the affairs of your Association. This is especially true this year since the interval between the annual meetings of our group is seventeen months.

Committee chairmen for all standing committees of the Association have been appointed and have been reported to you in the JOURNAL-LANCET from time to time. The president and president-elect have collaborated in the selection of committee chairmen with the thought in mind that a degree of continuity in committee personnel is highly desirable. Committee members have been selected by the chairmen, with the cooperation of the president, and all committee members have been notified of their appointment.

It is with regret that we must report the resignation of Dr. Charles Gossage from the University of Toronto Health Service. Dr. Gossage was vice president of the association and chairman of the committee on administration. A new chairman of the committee will be appointed shortly.

Acting on the premise that the strength of the national organization depends upon the strength of its individual units, Dr. William Nesbitt of the University of Wyoming is putting forth an intensive effort this year to increase and perhaps partially reorganize the activities of the local sections. To this end, a questionnaire will soon be sent out from his office which will stimulate our movement toward revitalization.

This office has been in communication with Dr. Ernest L. Stebbins, secretary of the recently organized American Board of Preventive Medicine and Public Health, regarding the eligibility of our members, engaged in full-time student health work, for membership. He states that any of our physicians engaged in or directing a well-rounded student health program would be considered as devoting a major portion of their time to the practice of preventive medicine and public health. If, therefore, they meet with the other required qualifications of the board, their applications for membership would be welcomed.

Any interested person who desires further information should communicate with Dr. Ernest L. Stebbins, secretary, American Board of Preventive Medicine and Public Health, 615 North Wolfe Street, Baltimore 5, Maryland.

You have recently received from the American Medical Association a questionnaire concerning the work and organization of your Health Service. The American Medical Association is desirous of recent first-hand information about the Health Services of the country in order to revise their 1936 report entitled, "University and College Student Health Services," and thus I believe it is to our advantage to give the necessary time to filling it out. The questionnaire was developed by the A.M.A. in collaboration with this office and with a number of the members of our Council.

Dr. Leona Yeager of Northwestern University is chairman of the local arrangements committee for the next annual meeting, and plans are well along toward completion. We have arranged for a diversified program which will prove of interest to all members. Special attention will be given at the Chicago meeting to the social and recreational aspects in the expectation that we can insure adequate entertainment opportunities.

The meetings will be on May 3, 4, and 5, 1951, at the Edgewater Beach hotel. Their facilities are excellent, and the meeting rooms are air-conditioned so that regardless of the whims and fancies of the weather, we shall be comfortable.

We urge you to make your plans now to be present in the expectation of a most enjoyable and profitable short vacation from your daily duties. You will shortly receive a preliminary program announcement and a reservation card for hotel accommodations. We hope you will ask for reservations *early*. It is of great help to the committee to have reasonable knowledge of the attendance in order to properly plan the activities of the meeting.

I hope that this letter finds everyone well rested from a good vacation and looking forward with vigor to the work of the year ahead. My personal greetings to each of you.

IRVIN W. SANDER, M.D., President,
American College Health Association

ARTIFICIAL KIDNEY INSTALLED AT BELLEVUE

An artificial kidney, a new mechanical device comparable in its benefits to the mechanical lung, and whose function is to aid patients whose lives are endangered because of the failure of their kidneys has been installed at Bellevue Hospital in New York City. A medical team, consisting of five physicians, a physiologist, a technician for blood chemistry, and a nurse trained in the special techniques required, has been formed to supervise the operation of the mechanical kidney on a 24-hour basis. The chief purpose of the artificial kidney is to provide relief for persons whose kidneys have failed to function by supplying a mechanical means for cleansing the impurities of the blood until the kidneys are again able to take up their task.

Transactions of the North Dakota State Medical Association

Sixty-Third Annual Meeting

Grand Forks, North Dakota, May 27-30, 1950

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To consider reports of the Committee on Medical Economics, including the Sub-Committees on Prepayment Medical Care, Veterans Medical Service and Rural Health:

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Proceedings of the House of Delegates of the NORTH DAKOTA STATE MEDICAL ASSOCIATION

First Session, Saturday, May 27, 1950

The First Session of the House of Delegates of the North Dakota State Medical Association was called to order by the Speaker of the House, Dr. A. E. Spear, at 8:15 P.M., in the Dacotah Room of the Dacotah Hotel, Grand Forks, North Dakota, May 27, 1950.

Dr. Fortney, chairman of the Credentials Committee reported that all credentials are in order and there to be a quorum of sixteen duly elected delegates present.

The Secretary, Dr. Sedlak, called the roll. The following responded: Drs. W. R. Fox, alternate, Rugby; E. M. Haugrud, Fargo; A. C. Fortney, Fargo; C. V. Bateman, Wahpeton; T. Q. Benson, Grand Forks; R. W. Vance, Grand Forks; J. D. Craven, Williston; A. R. Sorenson, Minot; D. J. Halliday, Kenmare; W. H. Gilsdorf, Valley City; R. B. Radl, Bismarck; R. O. Saxvik, Bismarck; R. W. Rodgers, Dickinson; T. E. Pederson, Jamestown; H. A. LaFleur, Mayville; T. M. Cable, alternate, Hillsboro.

Sixteen delegates answered the roll call. The Speaker declared a quorum present.

Minutes of the 1949 Meeting Approved

On motion of Dr. Halliday, seconded by Dr. Radl, and carried, the reading of the minutes of the 1949 session as published and circulated in the September 1949 issue of the JOURNAL-LANCET were dispensed with and the minutes adopted.

Introduction of President

The Speaker introduced the President, Dr. W. A. Wright, who welcomed the delegates to the convention and made the following remarks:

"I do not have a prepared speech to give you. I would just like to say that it has been a real pleasure to serve as president during the past year. It think it will be a wonderful thing for the Association to turn this office over to Dr. Larson, a man outstanding not only in North Dakota but in the affairs of medicine in the entire United States. It will be an honor and a privilege to have Dr. Larson as your president next year.

I would like to thank all the men who worked so hard with me in furthering the affairs of the Association this past year, particularly Dr. Philip H. Woutat, chairman of the Committee on Medical Economics. What he does is so extremely well done. I also wish to commend Dr. A. C. Fortney on the fine job he has done as chairman of our Committee on Public Policy and Legislation. Art has put a tremendous amount of work on this committee and the results have been favorable to the doctors in North Dakota. I also wish to mention one other thing, that is the present status of the North Dakota Physicians Service, or prepayment plan. All district societies are members, except one.

Now I know that the members of the reference committees will have to work long and hard, but I am sure the results will be of benefit to the profession of the state. Thank you."

Secretary's Report

Dr. O. A. Sedlak, Secretary, presented the following report, as prepared in the Handbook, which was referred to the Reference Committee on Reports of the President, Secretary, and Special Committees:

MEMBERSHIP: The total membership for 1949 was 377. Of this number 364 paid their annual dues and 13 were honorary members. Five members died during the past year and ten of those who paid their 1948 dues did not pay their 1949 dues.

Table I shows the annual membership for the past eight years. From this table one can readily see that the membership dropped until a low of 313 paid members were recorded in 1945. Since that time, there has been a slow but appreciable gain in membership.

Table I
Comparison of Annual Membership

	1942	1943	1944	1945	1946	1947	1948	1949
Paid Memberships	366	331	318	313	322	342	356	364
Honorary Membs.	10	11	10	9	9	8	5	13
Dues Cancelled— Military Service	32	61	59	57	4			
	408	403	387	379	335	350	361	377

Table II shows that the annual dues for 1950 are coming in quite promptly. There are still a number of members who have not paid their 1950 dues and the district medical society secretaries and councillors are urged to use every possible means to collect the dues of these delinquent members.

Table II

	April 20		May 5		May 1		Apr. 15	Apr. 30
	1943	1944	1945	1946	1947	1948	1949	1950
Paid-up Members	316	304	294	305	316	320	302	309
Honorary Members	10	10	9	9	8	6	9	11
To Be Honorary							4	1
Dues Cancelled, Military Serv.	58	59	57	?	0	0	0	0
Associate						1	1	0
	384	373	360	314	324	327	316	321

	State Association Memberships					General Memberships A.M.A.
	1949		1950			
	Pd. & Hon.		Reg. & Rtd.		Hon.	1950
First	78	–	67	3	–	65
Devils Lake	20	2	13	–	2	12
Grand Forks	60	5	42	1	4	37
Kotana	10	–	11	–	–	10
Northwest	59	1	42	–	1	40
Sheyenne Valley	10	1	8	1	1	8
Sixth	60	3	53	7	2&1	39
Southwestern	23	–	17	–	–	10
Stutsman)	20	1				
Southern)	7	–	23	1	1	22
Traill-Steele	11	–	13	–	–	9
Tri-County	6	–	7	–	–	5
	364	13	296	13	11&1	257
	377		309		321	

Of the 309 paid memberships to date, 13 are retired memberships, leaving a total of 296 regular memberships. Of the 296 regular memberships, 257 have paid their A.M.A. General Membership dues. Of the 309 paid memberships, 83.1% have paid their A.M.A. General Membership dues. Of the 296 regular memberships, 86.8% have paid their A.M.A. General Membership dues.

During the past year, your secretary managed to attend most of the meetings of the Council and most of the special meetings of various committees called throughout the year. He attended a meeting of the A.M.C.P. at Milwaukee, Wisconsin, and the annual meeting of the North Central Medical Conference in St. Paul in November. Both Mr. Engebretson and the writer attended a meeting of the Public Relations Committee and also a meeting of the Secretaries and Editors in Chicago. It is very difficult at times to get away to attend these meetings; however, I felt I gained a much greater insight into the workings of the organization by attending these meetings and I certainly do not regret the time spent.

As the years roll along, it is only logical that more and more work falls into the hands of the Executive Secretary. Much has been accomplished during the past years and at present, the office of the Executive Secretary is running so smoothly that all administrative affairs are taken care of through that office. I am glad things are working out so efficiently for I am sure that no full-time M.D. could possibly hold the office of Secretary and do that office justice at the present time without an Executive Secretary.

RECOMMENDATIONS: I have only one recommendation to make and that is to continue the office of the Executive Secretary.

Executive Secretary's Report

The year 1950 will be remembered as the year of blizzards, deep snow and floods. It will also be remembered as the year of almost impassable roads, by all of us who attempted to make meetings during the winter months. The year should better be remembered, however, for the spirit of unity which prevails among the membership.

1. *State Office:* The Association was fortunate four years ago in being able to secure the accommodations which house our State Office. The offices are most convenient and adequate. Our staff remains the same, with Mr. John Fox as director of the Veterans Medical Service Division; Mrs. Anita Meisner, his secretary; and Miss Rhea McDonald, the secretary of your reporter. Fine harmony prevails, and the staff is thought sufficiently large to carry out the program of the Association.

2. *Office Work:* The reactivation of the American Medical Association has made it possible for your State Office to accomplish much more this year in the way of bringing reliable information to the people throughout the state relating to the doctor's stand on compulsory health insurance. Good literature has been made available in almost unlimited quantities. The state of North Dakota ranks quite high in the distribution of such literature. In the day-to-day work of the office, we find more and more groups who are not only willing but anxious to cooperate with medicine in medicine's fight against the socialization of our economy. Such groups include the chambers of commerce, various insurance groups, dental and druggists' groups. Organized medicine, including your State Association, has played an important part in defining the issue of socialism versus freedom of enterprise, upon which issue more and more campaigns will be bitterly fought.

Although medicine was one of the first professions under attack and for that reason without much support in the battle, business, industry and other professions are realizing increasingly that the socialization of medicine is but one facet in an over-all picture; and medicine finds from day to day more and more support from the outside. It is an important job of the American Medical Association, your State Association, each doctor of this association and every doctor throughout the country to foster this understanding and elicit all possible support.

In this connection it is most encouraging to note that an ever-increasing number of physicians and an important number of the members of the Woman's Auxiliary are taking the time and effort to explain the stand of the American doctor to their own communities by making themselves available to address various meetings on the topic of socialized medicine. This is hard work, but the results of the effort are of the very best. There are now doctors and members of the Woman's Auxiliary in every section of the state who are willing to carry on this work. It is therefore recommended that each district medical society should be encouraged to establish a speaker's bureau so that this work may be efficiently continued.

Numerous requests also come to the State Office for speakers. We have thus far always been able to fill these requests, either by the use of a lay speaker or by a member physician. It is recommended, however, that to coordinate this work better that a State Speaker's Bureau be set up as a part of the work of the Committee on Public Policy and Legislation.

3. *Meetings:* The committees appointed by President Wright this year have been active, diligent and effective. Your Executive Secretary has attended the various meetings of the Council, the Committee on Medical Economics and its sub-committees on Prepayment Medical Care, Rural Health, and the Veterans Medical Service; the Committee on Public Policy and Legislation; and such other committees holding meetings touching on social and medical economic problems. He has planned for and arranged material for many such programs, and has attended as an observer or as a participator in numerous meetings of other groups whose problems are somewhat allied to those of the medical profession.

In the regional and national field, your Executive Secretary has attended the interim session of the house of delegates of the American Medical Association; its medical society executives conference; its conference of secretaries and editors of state medical associations; its national public relations conference; and the fifty-three man committee on public relations which continues to serve as a policy-suggesting body for the new A.M.A. national educational campaign, which is under the direction of Whitaker and Baxter.

Again, he attended the North Central Medical Conference held in St. Paul, and would like to recommend this meeting as a meeting which many members of this Association might find it convenient to attend, and would find wholly worth while.

He has also visited various North Dakota district medical societies at meetings held in Fargo, Grand Forks, Jamestown, Bismarck, Minot and Devils Lake; and has attended meetings of several of the district woman's auxiliaries.

4. *Legislative Activities:* This of course has been an off year for the North Dakota Legislative Assembly. The 1951 Session will convene next January. We have a very efficient Committee on Public Policy and Legislation, and I am sure that with the further support of the membership our technique in legislative action will be improved for the coming session.

In the national legislative field, we were met with a real test this past year when President Truman attempted to pass his Reorganizational Plan No. 1 through the United States Senate. This plan proposed the swallowing up of all medical activities in the Federal Government by the Federal Security Administration, and further proposed the elevation of Oscar Ewing, FSA administrator, to the post of Cabinet member as secretary of the Welfare and Health Department. This proposal was fought violently by medicine and other friends, and we are of course very gratified to report that it was defeated. Physicians in North Dakota took their part in this battle.

ACCOUNTS OF OFFICE OF EXECUTIVE SECRETARY

June 1, 1949 – April 30, 1950

	NDSMA			Convention		Public Relations		Medical Examiners		Total
Balance on Hand, June 1, 1949			— $188.63		$776.48		— $438.12			$149.73
Income, NDSMA			8,585.00							8,585.00
Income, Convention, 1949					55.00					55.00
Refund to cover deficits					629.41		955.13			1,584.54
Refund, Board Medical Examiners									$47.32	47.32
Income, Convention, 1950					780.00					780.00
			$8,396.37		$2,240.89		$517.01		$47.32	$11,201.59
		S.S.	Inc. Tax							
Executive Secretary, salary	$3,062.49	$31.45	$114.40							
Stenographer, salary	1,708.42	21.88	187.70							
Social Security, withheld	37.00									
Income tax paid (withheld)	252.90									
Office supplies	367.40									
Telephone and telegraph	217.45									
Rent	330.00									
Postage	107.08									
Travel	977.64									
Convention, 1949				$1,460.89						
Public Relations						$517.01				
Board Medical Examiners								$47.32		
Convention, 1950				187.45						
MISCELLANEOUS (Itemized below)	645.38									
Total Spent	$7,705.76			$1,648.34		$517.01		$47.32		$9,918.43
Balance on Hand			$690.61		$592.55		———		———	$1,283.16

MISCELLANEOUS—

Social security matched	$ 37.00
Furniture and fixtures	15.71
Cleaning	55.00
Power and light	8.42
Subscriptions, dues and donations	186.00
Repair, office equipment	22.16
Clerical	21.25
Bank service charge	6.15
Woman's Auxiliary	31.93
Advertising	18.00
Diabetes detection	50.00
Personal Property Tax	14.39
Insurance and bond	120.88
Meeting rooms	39.82
Flowers	10.20
Curtains	5.17
Cleaning supplies	3.30
	$645.38

VETERANS MEDICAL SERVICE DIVISION TRIAL BALANCE

January 1, 1947, through April 30, 1950

	Debit	Credit
First National Bank	$ 1,152.83	
North Dakota State Medical Association		$ 5,000.00
Medical accounts payable		5.896.00
Income fees		21,185.10
Old age benefit		6.75
Insurance—old age benefit matched	178.87	
Veterans Administration center	6,416.13	
Withholding tax		34.00
Printing	276.58	
Salaries	17,775.83	
Postage	1,321.02	
Office supplies	1,357.91	
Travel	445.08	
Rent	1,102.50	
Power and light	37.78	
Telephone and telegraph	248.72	
Furniture, fixtures and appliances	1,296.63	
Personal property tax	40.80	
Miscellaneous (cleaning, bond, bulbs, keys, misc. labor, bank service charge)	471.17	
	$32,121.85	$32,121.85

5. *Finance:* The preceding report is the financial report of the Office of the Executive Secretary. Under the constitution and by-laws, it is a province of the Council to accept or reject this report. It is nevertheless included in the report of the Executive Secretary so that the Reference Committee will be advised as to the financial expenditures of this office.

The Reference Committee will find the action taken by the Council regarding this report in the supplementary report of the Council. It is again recommended that a fund and an adequate amount be set aside for the payment of necessary meals for doctors attending state-wide meetings covering the business of their office or committees. As a method of holding the group between afternoon and evening sessions, such policy is of decided practical merit.

6. *Woman's Auxiliary:* The Woman's Auxiliary, in most of the district societies, has undertaken as its major project of the year a campaign to explain the doctor's position regarding socialized medicine to people within their own communities. This has been done largely by addresses by members of the Auxiliary before various women's organizations.

The Auxiliary has also done important work in providing public school libraries with authentic information regarding national compulsory health insurance. There may be a tendency for some district medical societies not to appreciate the tremendous help the Auxiliary can give to the doctors of the state. The Woman's Auxiliary has proven a most valuable adjunct, even in the short time of its existence. It is recommended that a resolution be passed expressing the gratitude of the Association for the work of the Woman's Auxiliary.

7. *Annual Session:* Your Executive Secretary wishes to express his appreciation to the members and committees of the Grand Forks District Medical Society with whom he has worked in connection with the 1950 meeting. You will note that we have even more exhibitors with us this year than we have had in the past. Several years ago the Council voted that no registration fee be charged any member of the Association attending the annual meeting. This means that the entire cost of the annual meeting is borne by these firms; and members are urged to visit these exhibits whenever intermissions are held, and show their appreciation to the exhibitors and their representatives.

8. Lastly, your Executive Secretary wishes to express his personal appreciation to all with whom he has had occasion to work during the last year. One needs but to look at the list of the officers, the Councillors, the members of the House of Delegates, and the list of officers of the various District Medical Societies to be assured that the business of the Association is in good hands.

E. F. Engebretson, Executive Secretary

Report of the Treasurer

Dr. E. J. Larson, Treasurer, presented his report as published in the Handbook:

Balance on hand, April 15, 1949			$15,553.15
	Receipts from dues	$19,110.00	
	Interest on bonds	112.50	19,222.50
	Total receipts		$34,775.65
DISBURSEMENTS.			
	Checks No. 559 to No. 577, inclusive.		
6-16-49	Office Exec. Sec., expenses	2,500.00	
6-29-49	Office Exec. Sec., expenses	2,500.00	
7-7-49	Mrs. R. B. Byrne, steno. services	190.00	
	J. H. Moore, M.D., delegate, A.M.A., 1948	169.88	
	W. A. Wright, M.D., committee expenses	150.00	
	A. C. Fortney, M.D., committee expenses	25.00	
	R. B. Radl, M.D., committee expenses	36.20	
8-6-49	Newberry Insurance Agency, Treasurer's bond	25.00	
9-23-49	Journal-Lancet, subscriptions, 1948-'49	1,424.00	
10-24-49	W. A. Wright, M.D., expenses	37.17	
	Office Exec. Sec., '49 Conv. deficit, Pub. Rel. May-Sept.	1,506.62	
12-1-49	Office Exec. Sec., expenses	2,000.00	
1-4-50	A. C. Fortney, M.D., expenses, Chicago	77.38	
	No. Cent. Med. Conf., 1950 dues	75.00	
	W. A. Wright, M.D., travel exp.	398.61	
3-23-50	Office Exec. Sec., balance of budget	1,585.00	
3-31-50	J. H. Bond, M.D., exp. Natl. Conf. Co. Med. Soc. Off.	227.32	
4-11-50	W. A. Wright, M.D., travel exp., Jan.-March	107.09	
	Office Exec. Sec., deficit, Public relations	77.92	
	Total checks issued	$13,112.19	
	Bank exchange	1.50	13,113.69
4-30-50	Balance on hand, James River National Bank, Jamestown		$21,661.96
	U. S. Government bonds		4,500.00
4-30-50	Total assets		$26,161.96

Report of Chairman of the Council, 1949-1950

Dr. A. D. McCannel, Chairman, presented the following report which was referred to the Reference Committee on Reports of the Council, Councillors, Delegate to the A.M.A., and Member of the Medical Center Advisory Council.

The report of the Council is now on a current basis, inasmuch as starting last year the supplementary report of the Chairman of the Council which was the result of the meeting of the Council immediately prior to the meeting of the House of Delegates was reduced to writing and included in the official minutes in the JOURNAL-LANCET. This year's report, therefore, commences with the meeting of the new Council.

There have been three meetings of the Council during the year 1949-1950. The supplemental report will be prepared for consideration immediately following the meeting of the Council to be held in Grand Forks at 4:00 P.M., May 27, 1950.

At the first session of the new Council, Dr. A. D. McCannel was re-elected chairman and Dr. C. J. Glaspel was re-elected secretary. Drs. McCannel, Waldschmidt and Sorkness were reappointed to the executive committee of the Council.

The following budget was prepared and approved by the Council:

Misc. travel expenses for various committees	$1,750
North Central conference	75
Official meeting stenographer	150
JOURNAL-LANCET	800
Salary, Executive Secretary	3,500
Rental	360
Lights	25
Telephone	200
Office supplies and postage	650
Stenographer	2,100
Traveling expenses, Executive Secretary	1,000
Miscellaneous fund, Executive Secretary	750
Woman's Auxiliary	200

This made a total budget of $11,560.00. There was no set amount for the Committee on Medical Economics, nor for the Chairman of the Council, or Emergency Fund of the Council. Traveling expenses of committee members must be approved by the Executive Committee.

The following committee expenses were approved:

Dr. W. A. Wright	$150.00
Dr. A. C. Fortney	25.00
Dr. R. B. Radl	36.20

It was further moved and seconded that travel expenses for Faye Byrne from Miller, South Dakota, to Minot, North Dakota, be approved.

It was moved, seconded and carried that it be recommended to the House of Delegates that Chapter VIII, Section 1 of the By-Laws be amended to read as follows:

> "The Committee on Scientific Program shall consist of six members of this Association, appointed by the President of this Association; two of which shall be appointed to three-year terms; two of which shall be appointed to two-year terms, and two of which shall be appointed to one-year terms. All successors to the original terms shall be appointed by the President for a term of three years each. The Committee shall hold its first meeting on or before the second Tuesday in December at which time it shall consider all suggested speakers for the scientific program, submitted by the members of this Association. The Committee shall select at least twenty-five per cent of the speakers on the scientific program from members of the Association, if practicable, and if there are not sufficient suggested local speakers to meet this quota, the Committee shall be authorized to request presentation of such papers from individuals who are members. It shall determine the character and scope of the scientific proceedings of the Association, subject to the provision of instructions of the House of Delegates or of the Association, or to the provisions of the constitution and by-laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the Association as nearly as is practicable."

An interim meeting of the Council was held in Grand Forks, November 12, 1949. A joint discussion was held with the Committee on Medical Economics and the State Welfare Board relative to the establishment of a new fee schedule. After a thorough review of the problem both from the standpoint of the doctor and the State Welfare Board, the Committee on Medical Economics was authorized to rewrite and submit a new fee schedule to the State Welfare Board.

A report from the Sub-Committee on Prepayment Medical Care was approved.

Dr. F. S. Crockett, chairman of the A.M.A.'s Committee on Rural Health, was a guest of the Council and participated in a general round table discussion.

A second interim meeting of the Council was held in Fargo, March 4 and 5, 1950. At a general meeting including the Council and the Committee on Public Policy and Legislation and Medical Economics, Mr. H. G. Nilles, a Fargo attorney and chairman of the board of directors of Blue Cross, described the background of the Blue Cross movement in North Dakota. Mr. Nilles had been asked to be present as some members had taken exception to the advertisements the Blue Cross were running in state papers, implying that North Dakota doctors did not approve of any kind of coverage other than Blue Cross coverage. After members of the Association had made themselves perfectly clear on the question, representatives of the Blue Cross assured doctors of North Dakota that the advertising policy of Blue Cross would be watched in an effort to avoid further antagonism between the doctors and members of the insurance profession.

A report from the Committee on Public Policy and Legislation was received and approved. The report contained a recommendation for the establishment of a grievance committee to which both patients and doctors may appeal when they believe that they have a real grievance in connection with their patient-doctor relationship. The American Medical Association has recommended that each state association adopt such a plan. After considerable discussion the Council took no action on this suggestion, but suggested that the plan be reviewed by the House of Delegates.

The Chairman of the Council, Dr. McCannel, gave a comprehensive report on the status of the University Medical

School, reporting both as a member of the Medical Center Advisory Council and as a member of the State Board of Higher Education.

The Committee on Medical Economics reported its progress in rewriting the State Welfare Board Fee Schedule. The schedule as written was adopted by the Council, and the Committee on Medical Economics was given power to make minor revisions in the same in further negotiations with the State Welfare Board.

Attention was called to the fact that the United States government is carrying on a series of instructional training programs for doctors and other scientists in the field of atomic warfare. A motion was made, seconded and passed, that the expenses of Dr. H. Milton Berg in attending a one-week course at the Argonne Laboratories in Chicago, Illinois, should be paid by the Council in the event that the X-ray Society did not see fit to pay all or part of the costs.

A bill submitted by Dr. John Bond, as representative to the National Conference of County Medical Society Officers held in conjunction with the annual meeting of the American Medical Association, in the sum of $227.32, was approved subject to Dr. Bond's submission of his report to the Association.

A short report was made by Dr. R. B. Radl on the status of the Veterans' Medical Home Care Plan. Some criticism had arisen, largely on the part of the Veterans' County Service Officers, as to psychiatric examinations. It was pointed out that the Veterans' Bureau rating boards were not complaining of these examinations. Dr. Radl was instructed, therefore, to write the Veterans' Advisory Council to the governor of the state of North Dakota, telling them that when criticism arose, the Association would see to it that the individual involved might be examined by another doctor of his choosing or preferably by the examining doctors in the Veterans' Hospital at Fargo, North Dakota.

Supplemental Report of the Chairman of the Council
May 27, 1950

Dr. Philip Woutat welcomed the members of the Council to Grand Forks.

Motion was made and carried thar the reading of the minutes of the last Council meeting be dispensed with. The minutes were approved as printed.

Dr. W. A. Wright, President of the Association, addressed the Council, expressing his appreciation of the fine work done by the Council during the past year and his personal appreciation for the aid given him by the Council.

Dr. Sedlak, Secretary of the Association, made reference to his report which is printed in full in the Handbook of the House of Delegates, stating that the membership has kept up to normal, and that he was very pleased with the response of the members conrributing to the A.M.A. dues.

The financial reports of the Treasurer and the Office of the Executive Secretary were submitted to the Auditing Committee appointed, consisting of Drs. Sorkness, Fawcett and Hanna. The Auditing Committee is to present their report at the next session of the Council on Sunday, May 28th.

After much discussion regarding the contract with the Journal-Lancet, it was decided that the Council could not take action on this matter at this meeting, but that it would be settled at the next session of the Council.

Mr. Engebretson, Executive Secretary, presented two bills from doctors attending national meetings. One from Dr. Berg, who attended the Atomic Energy course at the Argonne Laboratories for $133.85 was approved. Also one from Dr. Charles Arneson, chairman of the Emergency Medical Service Committee, for atrending a national meeting in Chicago, in the amount of $98.33, was approved. It was moved by Dr. Sorkness, seconded by Dr. Fawcett, that these bills be paid. Motion carried.

Dr. Wright brought up a resolution which was passed by the South Dakota Medical Association in regard to a joint meeting with the North Dakota Medical Association to be held in Aberdeen next year. This was discussed but no action taken.

Dr. Wright brought before the Council the fact that there is a possibility that Dr. Leonard Larson will be elected to the Board of Trustees of the American Medical Association at the coming meeting in San Francisco. Discussion was held regarding the possibility of Dr. L. W. Larson being a candidate for the vacancy on the Board of Trustees of the Amercan Medical Association. The Council unanimously approved backing Dr. Larson in the national election for this position.

Dr. Saxvik submitted his report on Multiphasic Screening Program. Dr. Sorkness moved that this subject be referred to the House of Delegates for their consideration. This was seconded by Dr. Fawcett and passed by the Council. (Plan in detail follows this report.)

Dr. Saxvik also brought before the Council the desirability of having a Heart Committee of the State Medical Association. However, as this would increase the number of standing committees, a discussion was carried on regarding the possibility of incorporating several standing committees under one or two headings. Dr. Hanna proposed and Dr. Waldschmidt seconded the motion that recommendation be made to the President of the Association that he consider amalgamating some of the committees, such as the committees on Tuberculosis, Venereal Disease and Pneumonia being incorporated under the Public Health Committee, and a Committee on Chronic Disease to include Heart, Cancer and Crippled Children Committee reports.

Dr. Waldschmidt proposed having fewer blanks to be filled out for hospitalization insurance coverage. It was moved, seconded, and approved by the Council that recommendation be made to the House of Delegates to place this matter in the hands of the Economics Committee, that a uniform insurance blank be adopted for filling out hospital insurance by the doctors.

Mr. Engebretson brought before the Council a few communications which he had received. One from the National Educational Campaign of the American Medical Association asking that resolutions be passed from all kinds of groups against National Compulsory Health Insurance. This will be brought before the House of Delegates at the first session. Also, a communication from the Carson, North Dakota, Commercial Club that the Carson community is very much in need of a doctor. There is nothing that the Council need to do about this as the matter will be handled through other channels.

After much discussion, it was moved and seconded and approved by the Council that it be suggested to the Presidenr that he ask for reports from the State Board of Medical Examiners, and State Health Planning Committees to be incorporated in the Handbook of the House of Delegates.

There being no further business to come before the meeting, the Council adjourned.

A. D. McCannel, M.D., Chairman

Multi-Screening Program

Introduction:

The Multi-Screening program for chronic diseases attempts to give to a single individual at a specified time certain technical screening tests that are specific in their results, are relatively inexpensive to perform, and that preferably do not require the immediate preference of a physician. These tests are objective and furnish the physician to whom the patient is referred valuable data upon which to base his diagnosis. The program is designed primarily in checking apparently well individuals who are not under a physician's care.

It appears logical that when apparently well persons come in for a routine screening test, such as a chest x-ray, that orher tests for chronic diseases could easily be performed at rhe same time. The early finding of indications of specific chronic diseases through the tests, plus the referral to physicians for diagnosis and follow-up, are invaluable in a chronic disease program. The individual will benefit from early treatmenr and at a time when he is still economically independent.

The State Medical Society would be requested to appoint a Medical Advisory Committee to guide the medical aspects of promotion and operation. (The Public Health Committee could probably assume this responsibility.)

Tentative Plan:

It is proposed to operate the Multi-Screening program through the districr health unirs. Additional employees will be placed in the district to operate the screening program and will be assigned other duties in the district during the days the screening program is not in operation.

The business manager of the district health unit will assist in establishing the locations and the advance publicity work. The screening team will have assigned to it a laboratory technician, a sanitarian, a clerk, a public health assistant, a nurse from the district health unit and a nurse from the county in which the screening team is operating.

The business manager would obtain locations in various towns within the district, preferably locations in an auditorium, school building or any large room which could be partitioned with portable partitions carried by the screening team. The power in the building would need to be 220 volt single phase AC for operation of the x-ray unit. The equipment carried by the team would be a portable 70 mm. x-ray unit, portable scales, a sphygmometer, a portable audiometer, sterilizer, syringes and auxiliary apparatus.

The individual to be examined would enter the testing procedure by the way of a registration desk where a clerk would type on the serially numbered form his name, address, age and his physician. The clerk would hand the individual the form and ask him to go to Station No. 2, where he would be weighed and his height measured. He would take the form to Station No. 3, where a 70 mm. x-ray of his chest would be made. At Station No. 4, a blood pressure reading would be taken and with the cuff still in place, a specimen of blood would be taken into a vacuum tube, which would be identified by the same number on the form (probably practical to perform hemoglobin determination at this time). At Station No. 5, a portable audiometer would be used for a hearing test. At Station No. 6, he would be handed a cylindrical cardboard container holding a corked 6 cc. test tube containing a tablet of thymol preservative. He would be directed to collect a specimen of urine, not to take the pill but to leave it in the test tube and to drop the container in the mailbox. The containers will be addressed to the laboratory and will not require postage. He could be handed several pieces of health education material and advised that the physician whom he named at the time of registration would be informed as to the findings. The whole procedure would take approximately 15 minutes.

The x-ray film would be mailed to the State Health Department where it would be developed and interpreted under the same procedure as the mobile units are operating.

The blood serology specimen would be mailed to the State Public Health Laboratory for routine tests which would include standard syphilis tests, a test for infectious mononucleosis, a spot test for brucellosis, hemoglobin determination, agglutination for tularemia, typhoid fever and Rocky Mountain Spotted Fever.

One copy of the form, once completed, is sent to the physician of the patient's choice. Twenty-four hours later, a postcard is sent to the patient advising him that the results of his examination have been sent to his physician and advising him to call upon his physician for interpretation. The patient after visiting his physician is re-examined to the extent thought necessary by the physician who returns to the Health Department the record and a note saying whether the arbitrary signs of abnormality are regarded by him as an indication of pathology or not.

Some of the expected benefits from the screening program would be:

1. Early indication of chronic diseases among apparently well persons with referrals to their own physician for a diagnosis and treatment.

2. Development of a closer relationship between patient, doctor and community.

3. The collection of data which would enable the Health Department to adjust its services according to greater needs and allow for a better expenditure of the tax dollar.

4. Provide scientific data for use by the medical specialists and various cooperating agencies.

REPORTS OF COUNCILLORS

First District

The First District Medical Society held eight well-attended meetings during the year 1949. In spite of traveling difficulties during the winter months there was always a good representation of our out-of-town members. Members of the Veterans Hospital staff of Fargo were in frequent attendance at the meetings.

At the January meeting it was decided that applicants for membership to the Society with transfer cards from a former medical society would be elected to full membership after three consecutive readings of their application. Also, that new members would be voted into the Society after a probationary period of six months rather than the twelve months as was the previous custom.

Drs. Lytle, Driver, Hall, Burton, Donat, Wright, Kulland, Nelson, Wold, Ahern, Klakeg, Armstrong and Peterson were elected to full membership. Dr. Marvin Geib, who practiced in North Dakota prior to the war, was reinstated to full membership.

The active membership at the time of writing is eighty. This does not include the associate members of the Veterans Hospital staff or the retired members.

The programs for the year covered a wide variety of subjects calculated to interest all the members of the Society. In March, Dr. R. V. Ebert spoke on chronic emphysema. In April, Dr. Thomas Kinsella spoke on suppurative diseases of the chest. At the September meeting we heard a very fine address by our State President, Dr. W. A. Wright, and also some remarks by Mr. E. F. Engebretson, the state Executive Secretary. The scientific program for October was presented by Dr. P. H. Thorlakson who spoke to us on diverticulitis and diverticulosis. In November we were fortunate in having Dr. E. T. Bell, emeritus professor of pathology at the University of Minnesota, speak to us on diabetic pathology. In December we held our annual business meeting. The January meeting was given over to the use of antibiotics as presented by Dr. Donald Nichols. In order to vary the program in February we were addressed by Mr. Phillip Vogel, a Fargo attorney, who spoke to us on medical malpractice liability.

The new officers elected for 1950 were Dr. Earl Haugrud, president; Dr. John Bond, vice-president; Dr. Hugh Hawn, secretary-treasurer. Delegates to the state convention are Drs. Earl Haugrud, Arthur Fortney and C. V. Bateman. Alternate delegates are Drs. Bond, Dillard and Beithon.

J. F. HANNA, M.D., Councillor

Second District

The Devils Lake District Medical Society, Second District, had five regular meetings in the past year, and one other meeting postponed on account of blizzard conditions. Interest has been uniformly good and attendance satisfactory. We have managed to have quite well arranged programs, and a guest speaker on each occasion.

There have been several discussions on the Blue Shield Medical Program, and general dissatisfaction has been expressed on these occasions as to the manner in which it was being promoted and sold. It appeared to this Society that sufficient push was not being given this program, and Mr. Eagles so advised. It was suggested to him that he put more pressure on sales program in and about this area.

A Diabetic Detection Drive was carried on in the city of Devils Lake for a five day period, but the response by the public was not too good. It was thought that probably there had been insufficient advertising, which may have been somewhat to blame.

Another project carried on in the city of Devils Lake during the past year was a special dinner arranged by the Chamber of Commerce honoring the older practitioners of the community, with the active cooperation and participation of the members of this Society. This was well received bv the public and proved to be a very nice gesture.

The Society gained three new members in the past year. There were no deaths.

JOHN C. FAWCETT, M.D., Councillor

Third District

The Grand Forks District Medical Society has had a very satisfactory year. The membership to date numbers 63, with 47 paying the A.M.A. assessment.

During the year nine meetings were held, all of which were well attended. Guest speakers included Dr. Graham Kernwein of Minot, Dr. B. M. Black of the Mayo Clinic, Dr. Harris Lynch of St. Paul, Dr. Leroy Calkins of Kansas City, Dr. Vic de Cardy, Dr. R. M. Marwin, Dr. C. J. Hamre of the University Medical School of Grand Forks, and Dr. A. E. Culmer of Grand Forks.

The following officers were elected at the December meeting: Dr. Ralph Mahowald, Grand Forks, president; Dr. C. R. Tompkins, Grafton, vice-president; Dr. L. S. Ralston, Grand Forks, secretary-treasurer. The delegates to the state convention are Dr. T. Q. Benson, Grand Forks, Dr. R. W. Vance, Grand Forks and Dr. George Waldren, Cavalier.

The Society will be host to the 1950 state convention which will be held in Grand Forks late in May. In addition the Society has sponsored the Diabetic Detection Drive for the past two years. The Grand Forks District Medical Society prize of $25.00 was awarded to William Hulet of Minot, who was the senior at the University Medical School who had the highest scholastic standing.

At the fall meeting of the Traill-Steele District Medical Society the following officers were elected: Dr. R. C. Little, Mayville, president; Dr. G. S. Wheeler, Portland, vice-president; Dr. Syver Vinje, Hillsboro, secretary-treasurer. The delegate to the 1950 state meeting was Dr. H. A. LaFleur, Mayville.

The paid-up membership for this year is twelve, eight of whom paid the special A.M.A. assessment.

Three regular meetings were held during the year with good attendance. Guest speakers were Dr. Coy C. Kaylor of Fargo, who spoke on Colles fracture, and Dr. E. A. Haunz of Grand Forks who discussed the Diabetic Detection Drive.

At the meeting held in Mayville in August 1949, the ladies of the Auxiliary served a picnic lunch in Woodland Park to which the medical membership was invited.

C. J. Glaspel, M.D., Councillor

Fourth District

The Northwest District Medical Society now has a membership of 59 paid-up members and one honorary member. As of March 20, 31 members had paid their state dues and all but one of these have paid their A.M.A. special dues.

Officers during 1949 were: Dr. M. W. Garrison, president; Dr. Robert Goodman, vice-president; and Dr. Henry Kermott, secretary-treasurer. Dr. Halliday was nominated as delegate to the state convention and Drs. Erenfeld and Woodhull as alternates. The present officers are: Dr. V. J. Fischer, president; Dr. R. T. Gammell, vice-president, and Dr. W. C. Hurly, secretary-treasurer.

The meetings have been continued, as in the past, alternating between the two hospitals—St. Joseph's and Trinity—which have excellent facilities for the meetings.

During the year six regular meetings were held with the following programs: On February 24, Mr. E. F. Engebretson, executive secretary of the North Dakota State Medical Association, gave a brief talk on various aspects of current legislation in Bismarck and discussed prepayment medical insurance. The North Dakota Physicians Service was discussed thoroughly and questions were answered by Mr. Engebretson. After considerable discussion it was moved by Dr. Cameron that the Northwest District reject the plan and the motion carried.

At the regular meeting on March 31 a film was shown on Red Cross First Aid.

Dr. Kernwein was the speaker at the meeting on April 28. He discussed the new program for the care of poliomyelitis patients in respect to their obtaining financial help from the local polio fund and presented examples of the various forms that have to be filled out for investigation of the individual case.

No meeting was held in May as we entertained the North Dakota State Medical Association.

Dr. R. Woolner of Rochester, Minnesota, was the guest speaker at the meeting held on September 29. His topic was "Tumor of the Lungs."

On October 27 an interesting talk on "Treatment of Varicose Veins" was presented by Dr. Emerson of St. Paul, Minn.

"Cerebral Spastic Conditions" was discussed by Dr. Perlstein at the December 6 meeting.

During the year one member, Dr. Andy Carr, died following rather a prolonged illness.

Archie D. McCannel, M.D., Councillor

Fifth District

There are ten members in our society, a loss of one over last year, Dr. Kent Westley of Cooperstown having moved. Nine of our members are in active practice, eight in Valley City and one in Cooperstown. One member, Dr. A. W. Macdonald, is retired and an honorary member of the State Association.

Three regular meetings of our society were held during the year. The annual meeting in January was devoted to the election of officers, and the discussion of veterans service plans, A.M.A. assessments, prepayment medical care plans and the State Welfare Board fee schedule.

Meetings were also held in July and November, and movie films on ano-rectal diseases, breast cancer, and cancer detection were shown. Because of the small membership in our society no effort was made to obtain outside speakers. Some of our members attend the scientific meetings of the First District and Stutsman County medical societies.

A Diabetic Detection Program was carried out by our society with very unsatisfactory results in that the response by the public was not sufficiently good to justify putting on the program.

A committee from our society has been successful in working out an agreement with our County Welfare Board with regard to fees for care of welfare board clients.

The officers of our society for the year 1950 are: Dr. Paul T. Cook, president; Dr. J. P. Merrett, vice-president; Dr. C. J. Meredith, secretary-treasurer; Dr. W. H. Gilsdorf, delegate, and Dr. Paul T. Cook, alternate delegate.

Excellent harmony and cooperation prevail in our society.

C. J. Meredith, M.D., Councillor

Sixth District

Four meetings of the society have been held during the past year with an average attendance of 32. The membership of the society is 65.

The present officers of the Sixth District Medical Society are Dr. C. A. Arneson, Bismarck, president; Dr. L. H. Fredricks, Bismarck, vice-president; and Dr. C. H. Peters, Bismarck, secretary-treasurer.

New members added during the year were: Dr. John R. Williams, Bismarck; Dr. Lester D. Shook, Riverdale; Dr. Robert B. Tudor, Bismarck; Dr. Myron Gughnour, Bismarck and Dr. J. C. McEwen of Bismarck. Dr. Fannie D. Quain, an honorary member, died in February, 1950.

Dr. O. C. Gaebe of New Salem was designated as the society's outstanding general practitioner for 1949.

Dr. Edwin Bayrd of Mayo Clinic, Rochester, Minnesota, gave the program at one meeting and spoke on "The Newer Treatments of Blood Dyscrasias." Dr. R. B. Tudor of Bismarck discussed "Clinical Aspects of Methemoglobinema Due to Well Water Ingestion" and Mr. W. Van Heuvelen, state public health chemist, discussed "Nitrates in North Dakota Drinking Water."

Dr. J. D. Cardy, pathologist at the University of North Dakota Medical School, presented a paper on "Coronary Heart Disease." Mr. E. F. Engebretson, Executive Secretary of the North Dakota State Medical Association, presented a discussion of the various medical problems, both local and national.

R. H. Waldschmidt, M.D., Councillor

Seventh District

The Stutsman County Medical Society, which is the Seventh District Society, had six meetings during the year 1949.

At the January meeting, following the election of officers, a report on the meeting of the District Society Officers and the Councillors at Bismarck was given by Drs. Larson and Nierling, who attended the meeting.

The next meeting was held in February at which time a colored film was shown on "Anomalies of Bile Ducts."

On May 26 a regular meeting was held. Dr. Richard Varco, associate professor of surgery at the University of Minnesota, was guest speaker. His topic was "Electrolyte Balance in Pre- and Postoperative Surgery."

At the next meeting on September 29 Dr. Pederson reported upon the plans for the Diabetic Detection Drive to be held the week of October 10-16. The Southern District Medical Society has been dissolved and the members were invited to become members of this society. A film was shown on "Surgical Treatment of Hypertension."

On October 27th, a brief report on the Diabetic Detection Drive was given. Drs. Beall, Martin and Maloney were admitted to the society. Mr. Don Eagles of Blue Cross and Blue Shield explained the organization and function of the latter.

The last meeting was held on December 1st. Mr. E. F. Engebretson, guest, spoke briefly on developments in the fight against socialized medicine and specifically mentioned the book "The Road Ahead." Dr. Willard Wright gave an interesting resume of developments in the line of County Welfare Board fee schedules, cooperatives and medical practice, the coming state meeting at Grand Forks, and lastly a dissertation upon the proposed medical center at Grand Forks.

The society has had two meetings thus far in 1950. On January 26 the following officers were elected for 1950: Dr. John W. Jansonius, president; Dr. Basil Maloney, vice-president; Dr. R. D. Nierling, secretary-treasurer; Dr. T. E. Pederson, delegate; Dr. J. N. Elsworth, alternate delegate; and Dr. R. Woodward, Dr. George Holt and Dr. F. O. Woodward, censors.

At this meeting Dr. J. J. Pier, pathologist at St. John's Hospital in Fargo, gave an excellent paper on "The Modern Concepts of Hypertension." A film "The Kidney in Health" was shown.

On February 23 the society held its regular meeting. Dr. Elsworth presented the program of the Security Council and their wish to establish a blood bank. The book, "The Road Ahead," was discussed and the society agreed to purchase copies of this book for distribution. Dr. E. O. Hieb was voted membership in the society. Mrs. P. C. Peterson of Jamestown, who spent several months in England last fall, spoke to the society upon her observation and experiences with medicine in England under the labor government.

JOSEPH SORKNESS, M.D., Councillor

Eighth District

The Tri-County Medical Society held four meetings during the year. Blue Cross and Blue Shield were discussed at one meeting, which was addressed by Mr. Don Eagles. The remaining meetings were devoted to viewing of medical and surgical films and discussion of current medical economic matters.

E. J. SCHWINGHAMER, M.D., Councillor

Ninth District

The Southwest District Medical Society as of December 31, 1949, had 23 members, the same as in 1948. We have two new members admitted during the year, Dr. Harlan Larsen, now associated with the Rodgers and Gumper Clinic, Dickinson, and Dr. Harold Helseth, practicing in Mott. Dr. Helseth is a transfer from Fergus Falls, Minnesota. Dr. Larsen recently completed hospital training at Ancker Hospital, St. Paul, Minnesota. Dr. E. E. Olesky of Mott left for special training in eyes, ears, nose, and throat and has not returned to the state. Dr. Sam Chernausek of Dickinson has retired.

During the year four society meetings were held. The first meeting was on January 8 in Dickinson, after a dinner for the society. Dr. Cartwright of Bismarck presented a paper on the Problem of Amœbic Dysentery. Mr. Don Eagles of the Blue Cross discussed the Problem of Blue Shield. Our Executive Secretary, Mr. Engebretson, was also present. The society voted at that time to accept the Blue Shield Plan as presented and voted to put it into effect as soon as possible. Due to the adverse weather conditions, the field work of selling the idea to the community was not possible until about the middle of March, 1949. Blue Shield has been well accepted by the society members as a whole. During the regular business meeting Dr. A. J. Gumper was elected president, Dr. C. R. Dukart, vice-president; Dr. H. L. Reichert, secretary; Dr. R. W. Rodgers, delegate to the state meeting; and Dr. Hans E. Guloien, alternate delegate.

The second meeting was held April 9, 1949. There was a joint dinner meeting with the Auxiliary at the St. Charles Hotel. Following the dinner meeting, Dr. F. T. Leittel of the Fargo Clinic presented a paper on "The Physiology, Differential Diagnosis, and Various Clinical Tests Used in the Study of Jaundice."

The third meeting was held September 30, 1949, at Dickinson. This meeting was called essentially to bring up the matter of Diabetes Detection Week. Mr. Fields of the Southwest District Health Unit showed us the film, "Wendy Hill," an educational film on diabetes. Co-chairmen of the diabetes program for this district were Dr. A. J. Spanjers and Dr. Harlan Larsen. The program was well accepted by the society members.

The final meeting of the year was held November 12, 1949, at Mott, North Dakota. The society members were the guests of Dr. Hill and Dr. Maercklein and the dinner was held at the Butts' House. Dr. Robert Radl of Bismarck, North Dakota, was the guest speaker for the evening. His subject was "The Changing Aspects in Medicine." The meeting was successful and the thought of having district meetings in the various towns of the district seems to be well worth while.

Fifteen out of twenty-three members paid the $25.00 special assessment to the American Medical Association. Those members who did not pay were the older physicians dropping out of practice or the completely new ones in the society.

During the year the various economic and political problems of medicine were brought up at each meeting, both in district society meetings and staff conferences. Information was passed on as much as possible by the committee members who received information from the American Medical Association, Shearon Medical Legislative Service, etc.

A. R. GILSDORF, M.D., Councillor

REPORTS OF STANDING COMMITTEES

The following reports of the Standing Committees were referred to the Reference Committee on Reports of Standing Committees, except the Report of the Committee on Medical Economics and Its Subcommittees:

Medical Education

The Committee on Medical Education held a meeting on February 11, 1950, in the library of the medical school on the University campus, Grand Forks, North Dakota. Those present were: Drs. R. E. Leigh, chairman, Grand Forks; W. A. Liebeler, Grand Forks; C. R. Tompkins, Grafton; H. M. Berg, Bismarck; R. W. Rodgers, Dickinson; F. D. Naegle, Minot; W. F. Baillie, Fargo; J. A. MacDonald, Cando; W. A. Wright, Williston, President of the North Dakota State Medical Association; W. F. Potter, Grand Forks, dean of the Medical School; and Mr. John Page, executive secretary of the Medical Center Advisory Board, Grand Forks.

The purposes for the meeting were reviewed as follows:

a. Survey medical education in the state.
b. Evaluate North Dakota medical requirements.
c. Make constructive criticism to those entrusted with medical education.
d. To function as liaison between constituted authorities and the doctors of the State Association.

A brief review of the 1945 Medical Center Enabling Act and the mill levy for support of the North Dakota Medical Center Program was made.

The committee reviewed the progress that has been made at the University under the direction of the Board of Higher Education, the University Administration and the Medical Center Board during the past year as it related to the Medical Center and Medical School. The committee noted the completion of the Medical School building and its improved equipment. It noted with satisfaction the additions that have been made to the Medical School faculty. The committee congratulated the Medical School for the establishment of a separate medical library. They commended University authorities for increasing the number of each of the Medical School classes from 25 to 30 students. The committee was informed that the administration is establishing an advanced Nurses' Training course to provide teachers for that profession. Also they were informed that a practical course for training laboratory technicians was being established.

A lengthy discussion was held relative to the feasibility and expense, in terms of returns to the people of North Dakota, of a proposed four-year school.

The main argument for a four-year school at the present time is the difficulty in transferring our 25 to 30 graduates for their third-year training. Reliable sources of information were quoted that led the members of this committee to believe that if the University of North Dakota's two-year school is brought up to a standard where it is second to none in the United States, all of our students will be transferred with little difficulty. The main objections to a four-year school were the marked increase in building space needed, the required University Hospital of 150 beds or more and the budget estimated at better than a million dollars per year to support the school. Comment was made on the report that doctors in Iowa were not satisfied with the plan there and that the school was having financial difficulties. Utah and Colorado were also having financial difficulties in operating their four-year school. These were such strong arguments that this committee felt that at the present time no plan to establish a four-year medical curriculum at the University was feasible.

A second plan was discussed whereby the University of North Dakota Medical School would affiliate itself with some other four-year school and automatically transfer the North Dakota two-year graduates to that school for finishing; the difficulty being to find such a school that would be willing to take our North Dakota men at a price we could afford to pay without completely relinquishing control of our own school.

The condition of the school at the present time was discussed, and the committee found that the most pressing need was a department of biochemistry headed by a clinical biochemist as a part of the Medical School faculty. This is in accordance with the recommendation made by the American Medical Association accrediting committee and the American Association of Medical Schools. We further recommend that a physician qualified in bacteriology be obtained to head a department of bacteriology, it being noted that in the last two years the two men added to the faculty in this department were not physicians, and that members of our graduating classes were poorly prepared to pass the National Boards in this field. This is a condition for accrediting which has not been fulfilled.

A discussion was held relative to establishing accredited internships and residencies in the major hospitals of the state by joint cooperation of the North Dakota Hospital Association and the Medical School. It is conceded that one of the best ways to obtain practitioners who are acclimated to our state, is to have the men serve their internships in the state. The committee suggested that the Medical School have a staff man whose duty is to take charge of postgraduate medical education. He would supervise the teaching program of the interns and set up and supervise refresher courses for the practitioners of the state; those courses to be given under the auspices of the Medical Center in the major cities. These courses would include not only doctors, but also nurses, technicians, and others concerned with public health.

A plan was discussed and referred for additional study that would propose that the Medical Center Board offer scholarships and loans for needy North Dakota students to enable them to complete their medical education, to aid them with internships, or to assist them in establishing a rural practice.

The committee noted that in November of 1948 the mill levy was passed by the people of North Dakota as a *demand* that more doctors be provided. The mill levy money is now available; therefore, this committee urges the Medical Center Board and the Board of Higher Education to consider the program that is outlined herein and proceed in any other way that will facilitate the fulfillment of the demands of the people of North Dakota. This committee urges that the members of the North Dakota State Medical Association and the citizens of North Dakota give the Medical Center Board and the Board of Higher Education their wholehearted interest and support in the fulfillment of these programs.

The chairman of your committee wishes to report pertinent events since the committee meeting. Your representative of the Medical Center Advisory Council will report directly to the House of Delegates on the actions of that council.

The Board of Higher Education met and considered the recommendations of both the Committee on Medical Education of the North Dakota State Medical Association and those of the Medical Center Advisory Council. They recommended that an investigation and a survey be made by representatives of the official rating bodies; namely, the Committee on Medical Education of the American Medical Association and the Association of American Medical Schools.

On April 6, Dr. Anderson of the A.M.A. and Dr. Smiley of the Association of American Medical Colleges spent two days at Grand Forks surveying the progress at the University Medical School and in Grand Forks. Their report will not be available until acted upon by their respective agencies.

R. E. Leigh, M.D., Chairman

Official Publication

This committee has not had a formal meeting during the year. The Journal-Lancet has continued to cooperate with our Association in every way possible. The issues devoted to special subjects during the year have been noteworthy. The Journal-Lancet is celebrating its 80th birthday this year. The February, 1950, issue contained interesting and valuable reviews of the history of medicine in Minnesota, Manitoba and the Dakotas.

North Dakota physicians are submitting more manuscripts to the Journal-Lancet each year. This is a healthy indication of the scientific growth of the medical profession in our state.

L. W. Larson, M.D., Chairman

Necrology and Medical History

Again we pause in our usual activities to pay sincere respect to the memories of those of our members who have been called to eternal rest, since we last met.

We note and remember their faithfulness, their sacrifices and their great devotion to our profession. We extend our deepest sympathy to their survivors. We will strive to emulate their example as we continue to carry the burden.

DR. WILHELM S. ANDERSON, 73, died June 26, 1949, at Northfield, Minnesota. A graduate of St. Olaf college, he took his medical course at the University of Minnesota, finishing with the class of 1903. He was licensed to practice in North Dakota in January of 1917. Dr. Anderson practiced in Warren and Minneapolis, Minnesota, and Grand Forks, North Dakota. He served in the medical corps during World War I, and was at Fort Snelling from 1921 until his retirement in 1944.

DR. EVAN C. STONE died August 4, 1949, in Minot after a long illness. A native of Minnesota, he was graduated from Hamline Medical School in 1905 and was licensed in July of the same year. Dr. Stone located at Balfour and practiced there for 17 years, then moved to Minot to continue in practice until his retirement in 1939. He served as coroner for both McHenry and Ward counties and as president of Mercy hospital. He also served in the 1939 session of the state legislature. Dr. Stone was a 40-year member of the Elks lodge of Minot and also belonged to Masonic and Scottish Rite bodies of Minot and Balfour and to El Zagal Shrine, of Fargo. Survivors are his wife, Mrs. Ann Stone and three children, Ardell of Mason City, Iowa; Mrs. Monroe Spear of Minot; and Cmdr. Evan C. Stone, Jr., Medical Corps, U. S. Navy, Saugus, Mass.

DR. FAYETTE D. KENDRICK died August 24, 1949, in St. Paul. He was 93 years of age and was said to be the oldest physician of Minnesota. Dr. Kendrick was a pioneer physician of North Dakota and practiced at Bismarck from 1885 to 1903, when he moved to St. Paul.

DR. MARTIN U. IVERS, 81, died September 13, 1949, in Fargo. A native of Minnesota, Dr. Ivers had a bachelor's degree in education from the St. Cloud normal school and taught school for a number of years before entering the University of Minnesota for his medical course. He graduated in 1902 and was licensed in North Dakota in July of the same year. He began the practice of medicine at Abercrombie and continued there until 1918, when he moved to Christine to practice with a brother. He was truly a pioneer physician and served a large territory. He held many positions of trust as coroner, school board member and as church trustee. Included in survivors are Mrs. Ivers, Dr. George Ivers, Ralph M. Ivers, sons, and a daughter, Mrs. Clifford Danielson, all of whom reside in Fargo. Two other daughters and a sister reside in the East.

DR. ALEXANDER B. FIELD, 86, died in a Grafton hospital, August 29, 1949. He was a native of Ontario, was graduated from the University of Toronto in 1891, and was licensed in North Dakota in 1892. Dr. Field located in Forest River, where he continued in practice during his professional life. He had served for many years as city councilman and as a member of the school board. He was a trusted pioneer doctor.

DR. GEORGE H. MILLER, 70, died recently in Los Angeles. He graduated from McGill University in 1901 and was licensed in October of the same year. He located at Stanley, North Dakota, the first doctor to practice in that city. Among survivors are Mrs. Miller, a son, Dr. Alden Miller of Los Angeles, his mother, three daughters, two brothers, two sisters and eight grandchildren.

DR. EDWIN L. GOSS, 84, died February 4, 1949, in Portland, Oregon, where he had resided since June of the previous year. Dr. Goss was born in Illinois and received his medical education at the College of Physicians and Surgeons of Chicago, was graduated in 1892 and licensed in North Dakota in 1902. He practiced in Iowa and served as a medical officer in the Army Medical Corps at Ft. Dodge before coming to North Dakota. Dr. Goss located at Carrington and held that field of practice for 47 years before removal to Portland. He also served as a medical officer in World War I. He was reliant, emphatic and dynamic and held many positions of trust and importance. He was a past president of the North Dakota State Medical Association. Dr. Goss had been a member of Masonic bodies at Carrington, York Rite bodies and the Shrine. Survivors are two sons and a daughter.

DR. FANNIE DUNN QUAIN, 75, passed away February 2, 1950, in a Bismarck hospital as a result of a heart attack. She was born in Bismarck, February 13, 1874, a daughter of John P. Dunn, pioneer druggist. She was graduated from the University of Michigan Medical School in 1898 and was licensed in North Dakota in October of 1899. She is believed to have been the first woman to practice in North Dakota and perhaps the first native of the state to graduate in medicine. After her graduation she returned to Bismarck and for a number of years was an active practitioner. She was married to E. P. Quain, M.D., in 1903. Dr. Quain had served on the local school board and at one time was county superintendent of schools. She was a past president of the state board of health; was an organizer and first secretary of the Tuberculosis Society; and was instrumental in the establishment of the San at Dunseith and also Camp Grassick for underprivileged children. Dr. Quain was a member of the Fifty Year Club of our Association. A son, Buell Quain, won distinction as an anthropologist before his death in the jungles of Brazil in 1939, while on a research trip. Survivors are a daughter, Mrs. Charles Kaiser of Portland, Oregon, and a brother, Piatt Dunn, former rancher and now a resident of Bismarck.

DR. JOHN H. RINDLAUB, 84, died March 12, 1950, in a hospital of his home city, Fargo. His death was caused by uremia. Dr. Rindlaub was a native of Wisconsin and after graduation from the State Teachers College at Platteville, served as principal of high schools for four years, with summers spent in advanced work at the University of Wisconsin. He graduated in medicine from George Washington University in 1893 and was licensed in North Dakota in January of 1896. Because of his scholastic ability and continued study he was granted additional degrees from Howard University and Harvard. Dr. Rindlaub studied abroad in Berlin, Dublin, London and Vienna as well as at Freedman hospital in Washington and the New York postgraduate school. He won the Seaman's prize for scholarship. He held the chair as professor of ophthalmology and otolaryngology of his alma mater until 1896, when he resigned to locate at Fargo. He was perhaps the first to confine his practice to his specialty He was later joined as associates by a sister, Dr. Elizabeth, and a brother, Dr. Martin. Dr. Rindlaub practiced in Fargo for more than 30 years, leaving in 1928 to practice in California. He returned to Fargo after five years because of ill health. He was a man of scholarly and professional bearing and deserving of the many honors which came to him. He was a past president of the State Medical Association. Due to his suggestion, interest and activity, he was largely responsible for the formation of the North Dakota Academy of Ophthalmology and Otolaryngology. He also was a member of the Minnesota academy as well as the national academy of his specialty. He was a member of the College of Surgeons. His interest in the profession brought him to office in many of these societies. Dr. Rindlaub is survived by three sisters, Dr. Elizabeth and Mrs. John D. Wooledge of Fargo and Mrs. John H. Robertson of Platteville, and two sons, Col. Bruce Rindlaub of Washington, D.C., and Newhall Douglas of New York City. The body of Dr. Rindlaub was returned to Platteville for burial.

DR. ANDY M. CARR, 59, died at his home in Minot, March 16, 1950. His death was attributed to a heart attack. He was a native of Northwood, North Dakota, where his father was a pioneer physician. Dr. Carr was a graduate of Minot High School and from the medical course of the University of North Dakota. He acquired his medical degree from Rush Medical College in 1915 and was licensed in January of 1921. He served his internship at Cook County Hospital of Chicago and practiced in that city for a short period. Dr. Carr served as a captain overseas in the first World War. He joined his father in special practice at Minot and was one of the founders of the Northwest Clinic, with the specialty of ophthalmology and otolaryngology. Dr. Carr was a past president of Kiwanis at Minot; was an original stockholder of the Country Club; served as a trustee of the First Presbyterian Church and held membership in the Elks and the American Legion. He was a past president of the North Dakota Academy of Ophthalmology and Otolaryngology. Survivors are Mrs. Carr, who was a nurse of World War I and whom he married in Paris, and three daughters, Mrs. Jack L. Hauge and Mrs. C. F. Ellison, and Mrs. Harry P. Steenstrup, who with their husbands are in Florida; and ten grandchildren.

DR. CLINTON SMITH, 71, passed away January 22, 1950, at Miami, Florida, where he was spending the winter. He was a native of Allandale, Illinois, and after completing his preliminary education started the medical course in Louisville, Ky. He later transferred to Northwestern University, where he was graduated in 1903. He was licensed to practice in North Dakota, January 14, 1904. Coming to Devils Lake, Dr. Smith became a pioneer physician of that area. He was a charter member of the Phi Beta Phi fraternity. Dr. Smith was one of five pioneer doctors honored in December, 1949, by the Devils Lake Medical Society and the Chamber of Commerce. The President of our State Association, Dr. Wright, gave the main address. The funeral was held at Devils Lake, where Mrs. Smith still lives.

DR. JOHN J. SEIBEL, 60, died recently after moving to Lodi, Calif., in 1938. He became a member of the California State Medical Association. Dr. Seibel graduated in medicine from the University of Minnesota with the class of 1919 and was registered to practice in North Dakota in 1925. Early after registration Dr. Seibel established himself at Harvey and was a valued member of the Tri-County Medical Society until his removal to California.

DR. JOHN H. BOND, 39, passed away at his home in Fargo as a result of a heart attack April 28, 1950. Dr. Bond was born August 31, 1910, at Sacred Heart, Minnesota. He spent most of his boyhood years at Marmarth, North Dakota, later moving to Fargo. He was graduated from the North Dakota Agricultural College at Fargo, attended the medical school of our University, and obtained his medical degree from the University of Pennsylvania in 1936. His internship and a two year fellowship were taken at the University Hospital in Minneapolis. Dr. Bond was married in May 1937 to Kathryn E. Paulson, daughter of Mr. and Mrs. H. D. Paulson of Fargo. After a few months in practice at Jacksonville, Texas, he located in Fargo in 1940. He was registered in North Dakota in 1940. Dr. Bond first was in private practice in Fargo, later joining the Hanna, Clay, Lancaster group. After special training in internal medicine he became a member of the Dakota Clinic in 1943, where he continued practice in his specialty. He was a past secretary and at the time of his passing, vice-president of the First District Medical Society. He was an alternate delegate to the coming meeting of our State Association and was our state representative to the National Conference of County Medical Society Officers. Besides his parents, Mr. and Mrs. H. H. Bond of Fargo, immediate survivors are Mrs. Bond and their four children, Kathryn Terrill, John Jr., Mary Ann and James.

DR. H. E. NEVE, 47, of Rolette, North Dakota, died April 22, 1950. Dr. Neve was a native of Bowbells, North Dakota, and was educated at the N.D.A.C. at Fargo and the University Medical School at Grand Forks. He was graduated in 1937 from Rush Medical College and served his internship at San Bernardino, California, and his residency at Presbyterian hospital of Hollywood, California. Dr. Neve was licensed in 1941 and had practiced at Bismarck, Minot, Hope and San Haven before becoming superintendent of the Rolette Community hospital. He was civic-minded and had served as mayor, president of the school board, county coroner and on the County Insanity Board, as well as the Board of Health. Dr. Neve belonged to the Masonic bodies and the Shrine. Mrs. Neve and a son Paul, aged 9, survive.

DR. VIRGIL H. MOATS, 77, passed away May 3, 1950, in a Fargo hospital. Dr. Moats was a native of Ohio and obtained his medical education in the department of medicine of Hamline university, St. Paul, Minnesota. He was graduated in 1908 and was registered to practice in North Dakota in 1910. He served as a medical officer in World War I, after which he practiced in McClusky. Surviving Dr. Moats are Mrs. Moats and two daughters, living respectively in Minnesota and Nebraska.

DR. W. F. BAILLIE, 72, passed away in a Fargo hospital May 5, 1950. Dr. Baillie was a native of Scotland, coming with his parents to this country in 1883. For several years the family lived in Iowa and came to Barnesville, Minnesota, where he grew to manhood. He attended Macalester college of St. Paul and received his medical degree from the University of Minnesota in 1903. He spent his internship at St. John's hospital in Fargo and was licensed to practice in North Dakota in 1904. Dr. Baillie then located at Hunter, where he practiced for nearly 20 years. He came to Fargo in 1923 and became associated with the Fargo Clinic. He had served as president of the board of directors of the Clinic, as well as president of the staff of St. Luke's hospital. He held important committee appointments of our State Association. He was a fellow of the International College of Surgeons. Dr. Baillie was a lifetime sports enthusiast and had been a skillful baseball player in his younger years. He never was too old to enjoy golf. Dr. Baillie was married to Gertrude Morey of Minneapolis in 1913. He was a trustee of the First Presbyterian Church; a member of the Hunter Masonic Lodge; Scottish Rite Bodies in Fargo; El Zagal Temple of the Shrine; the Fargo Elks Lodge and the Fargo Country Club. Survivors besides Mrs. Baillie are a son, Glen, a senior at the N.D.A.C.; three daughters, Mrs. C. Warren Litten and Mrs. John W. Shotwell of Fargo and Mrs. George W. Hosfield, Sacramento, California; a sister, Mrs. E. F. Morey, Palo Alto, California, and eight grandchildren.

F. L. Wicks, M.D., F. I. Darrow, M.D.,
Co-Chairmen

Executive Secretary's Note:

In the February 1950 issue of the Journal-Lancet, being their 80th Anniversary number, there appeared a short history of medicine in North Dakota. This very fine history is the contribution of Dr. F. L. Wicks, who has so faithfully served as the chairman of this committee for many years.

Pneumonia

The Committee on Pneumonia held no formal meetings during the current year. It would appear that the Committee on Pneumonia has accomplished to some extent the work that it set out to do and hence any meetings are more or less superfluous. Your chairman points out that there was a death rate last year of 16 per cent, which would seem to be too high with the type of medications available at the present time. It should be definitely lower than that. This year's results are even worse as the following report shows a death rate of 22 per cent.

Pneumonia Cases by Month

Month	Cases
January	91
February	78
March	74
April	86
May	60
June	42
July	39
August	33
September	33
October	48
November	70
December	108
Total	762

Pneumonia Cases by Age and Sex

Age Group	Male	Female
Under 1 month	10	4
Over 1 month and under 1 year	81	44
1 to 4	69	69
5 to 9	29	26
10 to 14	13	9
15 to 19	12	7
20 to 29	24	9
30 to 39	21	11
40 to 49	13	9
50 to 59	36	11
60 to 69	34	15
70 and over	83	67
Not stated	34	22
Total	459	303

Kind of Pneumonia

Lobar	213
Broncho	418
Other	74
Not stated	57
Total	762

Place of Treatment

Home	53
Hospital	544
Not stated	165
Total	762

Pneumonia Deaths

	1948	1949*
Broncho	83	76
Lobar	43	56
Virus, atypical	2	7
Pneumonia unspecified	20	29
Total	148	168

*Provisional

O. W. Johnson, M.D., Chairman

Public Health

The Committee on Public Health of the North Dakota State Medical Association called its regular meeting in Bismarck, North Dakota, March 11, 1950.

C. O. McPhail, M.D., Crosby, North Dakota, was the only member present except the chairman, and it was felt that no resolutions could be made. Therefore, a negative report is submitted.

Russell O. Saxvik, M.D., Chairman

Maternal and Child Welfare

The Committee on Maternal and Child Welfare of the North Dakota State Medical Association met in Bismarck on January 21, 1950, and in Fargo on March 4, 1950.

The committee submits the following recommendations:

1. For the past two years the Committee on Maternal and Child Welfare has made a request to gather information concerning the relationship between German measles and other virus infections during pregnancy and certain abnormalities occurring to the newborn. Insufficient information has been obtained to make a conclusive statement or to warrant a continuation of this study.

2. It is recommended that the continued study of nitrates in drinking water and its association with methemoglobinemia be brought to the attention of the physicians in the state through the several medical societies.

3. As no maternity home in the state and 32 hospitals in the state do not have incubators in their delivery rooms and 21 hospitals do not have incubators in their nurseries and as the premature death rate in North Dakota continues to remain rela-

tively high, it is recommended that the Health Council of the State Department of Health incorporate regulations requiring these incubators in all maternity homes and hospitals.

Further, it is recommended that, inasmuch as 20 hospitals do not have any type of mechanical resuscitator, regulations be developed requiring all hospitals to have an adequate resuscitator available in their obstetrics and/or pediatrics departments.

4. It is recommended that adequate incubators be provided on a ratio to births consistent with the recommendations of the Committee of Infant Care of the American Academy of Pediatrics.

5. It is recommended that all hospitals be provided with a copy of the recommendations of the American Academy of Pediatrics for the care of the newborn, and an attempt made by them to put as many of these recommendations into force as possible.

P. W. Freise, M.D., Chairman

Cancer

The Committee on Cancer was increased from four to seven members during the past year. This was done to provide better geographical distribution of the membership and also to provide seven professional members on the board of directors of the recently incorporated North Dakota Cancer Society.

The committee met in Bismarck on December 29, 1949. All members were in attendance. The committee discussed the cancer situation in the state and then adjourned to attend the organization meeting of the board of directors of the North Dakota Cancer Society. Through the generosity of the citizens of North Dakota and the wise and careful expenditure of its funds over the past several years, the society has accumulated a relatively large surplus of money. The board unanimously agreed that the time had come for the society to expand its activities, limited in the past to education and service, to the promotion of research in cancer. Accordingly, $42,850 was appropriated to the North Dakota Medical School in the form of institutional ($18,450) and research ($24,400) grants. The institutional grants were earmarked for the departments of pathology, physiology, and anatomy, the funds to be used mainly for the purchase of special cancer research equipment. The research grants were earmarked for the salaries of technical personnel and research fellows, and the cost of expendable equipment and materials such as experimental animals and chemicals.

"A cancer detection center in every doctor's office" is the aim of the Committee on Cancer. The American Cancer Society, through its nation-wide program of education, is stressing the importance of periodic physical examinations. It also warns the people of the danger signals of cancer and urges people to consult their family physicians immediately whenever one or more of these signals occur. As a result more and more people are consulting their physicians for a "checkup." The responsibility of the physician in this program is obvious. He must give such patients a complete physical examination. In addition he must exercise a constant awareness of the early signs and symptoms of cancer and insist that the slightest indication of the presence of cancer demands a thorough investigation. This may involve procedures beyond his resources. If so, it is his duty to refer the patient where specialized facilities are available.

The State Cancer Society again co-sponsored a refresher course on cancer at the University of Minnesota continuation center in February. Twelve North Dakota physicians attended the course. A total of 150 North Dakota physicians have availed themselves of this opportunity to refresh their knowledge of cancer and to learn new methods of diagnosis and treatment since the refresher courses were started several years ago. It is the hope of the committee that every physician in the state will be able to attend one of these refresher courses so that the slogan "a cancer detection center in every doctor's office" will become a reality.

The need for continued support of the State Cancer Society by all physicians in the state is obvious. The society carries its message to the people through volunteer workers. These men and women, who give freely of their time and energy, deserve our wholehearted support.

L. W. Larson, M.D., Chairman

Tuberculosis

The Committee on Tuberculosis can again report steady progress in the control of tuberculosis in our state.

Dr. W. L. Wallbank reports increased length of time of treatment prevails at the state sanitarium.

The report on mobile x-ray units is summarized as follows by Dr. R. O. Saxvik:

Summary of Chest X-ray Surveys, 1946, 1947, 1948, 1949

	1946	1947	1948	1949	Total
Total Satisfactory Films	29.054	89,591	70,246	56,820	245,711
Negative	26,998	85,435	67,839	55,379	235,651
Suspicious	——	1,966	1.361	868	——
Percentage of total		2.2%	1.9%	1.5%	
Positive	——	117	116	36	——
Percentage of total		0.1%	0.2%	.1%	
Other Pathology	——	2,073	930	537	——
Percentage of total		2.3%	1.3%	.9%	
Referred to Physician	2,056	4,156	2,407	1,441	10,060
Percentage of total	7.1%	4.6%	3.4%	2.5%	4.1%

The committee wishes to report on an additional tuberculosis control work started in our state; that is, tuberculosis testing in our schools throughout the state. This work is now on a nation-wide basis and our state is particularly suited for this work, because as J.A. Myers, M.D., states: "This project has been so effective that we are now anxious to have it extended to the ten states which have low mortality rates. These are Iowa, Idaho, Kansas, Minnesota, Wisconsin, North Dakota, New Hampshire, Utah, Nebraska and Wyoming. We believe that the incidence of infection is so low in these ten states that this refined method is applicable and is the quickest way of bringing about eradication of tuberculosis."

Dr. A. F. Hammargren has been named chairman of the sub-committee on tuberculosis for North Dakota of the American School Health Association. Serving also on this committee are Dr. Robert Goulding of Bowman and Dr. F. E. Wheelon of Minot. Dr. R. O. Saxvik, state health officer, has promised his help and cooperation. The work will be closely allied with the work of the State Health Department.

The first school to be certified in the state is the Rhame school under the supervision of Dr. Robert L. Goulding. We hope this program will become effective in our state.

A. F. Hammargren, M.D., Chairman

Fractures

No meetings of the Committee on Fractures were held during the year 1949, but we have urged the continuance of our policies as carried out in previous years.

R. H. Waldschmidt, M.D., Chairman

Public Policy and Legislation

The Committee on Public Policy and Legislation has been organized so that there is a representative from each district medical society of the state on the membership roll. Since one of the major objectives of this committeee was to combat socialized medicine it was felt that before any general state-wide education program could be undertaken it was necessary to educate the doctors in the state first and attempt to get us all thinking in the same channel. This was also the opinion and suggestion of the national association. As a result, each one of our committee men has been instructed to give five or ten minutes at the beginning of each district meeting to disseminate information that has come in and to keep the membership abreast of the present trends in the battle against socialized medicine. This apparently has worked out quite well in the state. We do not know each person's attitude, but we do feel that everyone knows significantly more about the whole controversy.

The national meetings have been attended by the Executive Secretary, the State Secretary and the Chairman of the committee. Considerable information has been obtained which has been passed on to the committee and then to the district society. Recently the Council of the North Dakota State Medical Association met in Fargo and a report was presented to the committee. At that time it was felt that much of our education program should be submitted locally through the respective district medical societies by giving talks before any of the local groups in their area. Where this has been done it has been recognized gratefully and reports from various speakers indicate the high and intelligent interest that has been shown by their listeners. We believe that this combined with the doctor's own efforts in his office at the psychological moment is the best way to further our cause. It has also been recommended by the committee that education and information be given to the public concerning present day medical problems. This has been suggested to clarify much misinformation that is appearing in the press and over the radio concerning some of the newer preparations in the treatment of disease. We believe that this again is a local problem and should be handled by a committee from each district medical society working hand in hand with the newspaper and radio serving their community.

President Truman's Reorganization Plan No. 1 was defeated in Congress greatly through the efforts of the Medical Association. When the vote came up in the Senate, Senator Milton Young was found voting against the plan whereas Senator Langer voted for it. The plan did not come up before Congress so Congressmen Burdick and Lemke were not required to vote. However, correspondence from both of these congressmen indicated that they would have voted against the bill.

It seems that at the present time a broad over-all socialization of medicine program is going to be discarded. It is becoming more apparent that an attempt now will be made to bite off small pieces by legislation that seems almost borderline and in which there might not be too much disagreement. However, we have been warned that this probably is the most dangerous method because little by little legislation can be adopted until finally the steam roller begins. Because of that, practically all of the legislation has been opposed by the advisory committee of the American Medical Association. It is well to remember that the United States Supreme Court handed down a decision in the early 40's that whatever industry the government subsidized they also could regulate.

The coming elections must be watched by every member of the Medical Association. Neither your county nor district society, nor the state association, can in any way officially participate in backing or opposing a candidate. However, as a citizen you have a perfect right to do so and to join any organization or to help any organization for that particular purpose. However, it must be understood that this is not any official district or state association backed plan. As soon as the candidates have been definitely chosen this committee will receive in writing from each one their stand on the socialization of medicine. This will be transmitted to each member of the association through this committee and without any recommendation.

Many state associations have adopted what they call a grievance committee, to which both patient and doctor alike may appeal when they believe that they have a real grievance in connection with their patient-doctor relationship. The national association has recommended that each state association adopt such a plan. This recommendation was made to the Council but no action was taken and it was suggested that a plan be reviewed at the time of the meeting of the House of Delegates. Such a plan as being worked out by other states will be presented as a supplement to this report at the time of the meeting of the House of Delegates.

At the present time there apparently does not seen to be any particular local legislation in the hopper that will give us trouble. However, bills come up out of the clear sky so we must be ready to combat any unfavorable legislation at the next session in January and February, 1951.

A. C. Fortney, M.D., Chairman

Crippled Children

Under the auspices of this committee, the Third Annual Cerebral Palsy Clinic for North Dakota, by the joint invitation of the North Dakota State Medical Association, the North Dakota Department of Public Welfare, the North Dakota Department of Public Health, and the North Dakota Chapter of the National Society for Crippled Children and Adults, was held at Minot, on December 5 and 6, 1949.

This clinic was again conducted by Dr. M. A. Perlstein, a member of the medical advisory council of the National Society for Crippled Children and Adults, Chicago, Illinois.

The pattern of the clinic followed that which had been used previously and was very largely attended. The interest of the general public in the cases of cerebral palsy has been awakened to the extent that many persons attended the clinics to learn more of this condition and not because of any direct bearing it has upon themselves.

A. R. Sorensen, M.D., Chairman

Venereal Disease

During 1949, a total of 73 patients were treated under the Hospital Bed Program by physicians throughout the state.

The Ambulatory Treatment Program was initiated on July 1, 1949, and during the first six months of operation of the program, a total of 66 patients were treated on an ambulatory basis by the physicians throughout the state.

Two venereal disease investigators are maintained by the State Department of Health. One of the investigators is stationed at Fargo and the other at Bismarck. During the year, 442 investigations were completed. As a result of these investigations, 124 were brought to treatment for a venereal disease.

Syphilis Cases by Stage

Primary	48
Secondary	19
Early Latent	51
Late Latent	52
Late (Tertiary)	26
Neurosyphilis	14
Congenital	8
Not stated	19
Total	237

Gonorrhea Cases by Stage

	Acute	Chronic
All ages	142	18
Under 1 year	—	—
1 to 14	2	4
15 to 24	48	6
25 to 44	73	4
45 to 64	9	1
65 and over	1	—
Unknown	9	3

F. I. Darrow, M.D., Chairman

Report of the Committee on Medical Economics and Its Subcommittees

The report of the Committee on Medical Economics and its Sub-Committees was referred to the reference committee to consider the report of the Committee on Medical Economics, including the sub-committees on Prepayment Medical Care, Veterans Medical Service and Rural Health.

At the 1949 session of the House of Delegates the officers of the North Dakota State Medical Association were instructed to rescind the existing Welfare Board fee schedule. This was done by the new officers during the summer months. Considerable confusion resulted among the various county welfare boards and physicians. In October, 1949, the State Welfare Board requested that we consider drawing a new fee schedule. The Committee on Medical Economics met in Grand Forks on November 12 with the executive director of the State Welfare Board, Mr. Carlyle Onsrud, and members of his staff. At that meeting the problems of the state and county welfare boards were presented, as were those of the physicians throughout the state.

After considerable discussion, it was decided by your committee to draw a proposal for a new fee schedule. This was done during the fall and winter months, and the final proposal completed by your committee and other interested members at a meeting at Fargo on March 4 and 5, 1950. The committee's recommendations were approved by the Council of the State Association at that meeting, and at the time of writing this report, have been presented to the State Welfare Board. We hope a new schedule will be in effect by the time of the state meeting.

Voluntary hospital, surgical and medical care insurance plans continue their phenomenal growth, both in our state and throughout the nation. Improvement in the policies of Blue Cross-Blue Shield, and those of the insurance companies continues. The interest of the people of the country in this type of insurance is reflected in the rapid increase in enrollment. Inferior policies are being sold in this state by a few insurance companies. Many patients have already been disappointed in such policies with resulting harm to the cause of voluntary sickness insurance. There is no easy answer to this problem. Between Blue Cross-Blue Shield and numerous sound insurance company policies, almost anyone can obtain the coverage his particular situation requires. We must all be informed, and when the opportunity presents itself we must warn our patients to investigate carefully, compare policies, and understand exactly what they buy.

The various congressional bills seeking to socialize the practice of medicine appear to be at least temporarily stalled. The rapid growth and improving coverage of voluntary insurance plans; recent events in England; the educational campaign of the American Medical Association, and of the numerous allies we have acquired, have all had a large part in this. The proponents of this type of legislation are developing new approaches, apparently designed to sneak in bit by bit. These new bills are most dangerous in that they appear mild. They must be opposed with as much vigor as any other such proposals.

It is becoming apparent to more and more people that the issue is not only socialized medicine, but socialism itself. This realization has brought us many strong and influential allies. We must oppose socialistic bills in other than the medical field, or we might find ourselves in the same position as our allies would be in were medicine to be socialized—next in line and easier to push over.

Accordingly, we must keep informed, help inform others, and oppose socialism on all fronts.

The House of Delegates of the American Medical Association has recommended that all state associations appoint committees on physician-hospital relationships. This has no doubt been stimulated by unfavorable attitudes on the part of some hospitals toward physician anesthesiologists, pathologists, and radiologists, in certain parts of the country. Without question there have been unethical practices, and at times, frank exploitation of the services of these groups by some hospitals. The House of Delegates of the American Medical Association has formulated fair ethical standards for such relationships, and it is to the best interest of patients, hospitals and physicians that they be followed.

As far as this committee knows such abuses do not exist in this state, so no action is considered necessary or advisable at this time. At present it is sufficient that we all be aware of these developments in other parts of the country, and remember that what happens to one group may well happen to other groups. It may be advisable to have such a committee in the near future or to delegate such functions to one of our standing committees.

PHILIP H. WOUTAT, M.D., Chairman

Prepayment Medical Care

This past year has seen definite expansion of the North Dakota Physicians Service throughout the state and approval by all district societies except one or two. The committee feels that voluntary forms of insurance against medical and hospital costs remain the most important factor in keeping government out of medicine and encouraging the people to look upon health as an individual problem and not a national one.

The committee met at Grand Forks on November 12, 1949. The new "All Comprehensive Blue Cross Policy" was discussed and it was decided to mail a mimeographed form describing the benefits available to the patient under such policy. The average policy holder is not satisfied with the original low cost standard policy because of its inadequate coverage. Since its inauguration hospital costs have increased considerably. The ultimate aim must be complete coverage for all services as is attempted in the new all comprehensive policy. Here again the doctor must be cautioned against the abuse of the plan by indiscriminate use of costly diagnostic facilities.

Dr. Sedlak explained the desire for a national enrolling agency and underwriter's organization to enroll national accounts and to level the differences of coverage in connection with the national accounts policies from state to state.

Dr. Woutat brought up the question of payment to North Dakotans holding policies when they were unexpectedly stricken with sickness when outside the state. It was felt that the policy holder should be entitled to 100 per cent rather than but 75 per cent of the amount listed in the fee schedule.

The second meeting was held in Fargo, March, 1950, at which time the sub-committee on Prepayment Medical Care together with members of the Committee on Medical Economics were addressed by Dr. Herbert Nilles, president of the board of directors of Blue Cross. The statement that "Blue Cross is the only insurance approved by hospitals" used in Blue Cross advertising was criticized as unfair advertising. Considerable discussion ensued, after which it was felt a better understanding was arrived at between the two groups.

Methods of interesting the people of the state were considered and various methods such as promotional literature, newspaper advertising and radio were discussed. The electrical transcription service of the A.M.A. to state and county medical societies has grown tremendously in recent years and in 1948 and 1949 the so-called "platters" were used in excess of 10,000 local broadcasts in every important area of the United States. It was felt, however, that this should be undertaken only after more careful investigation.

It has been pointed out that by the end of 1950 at least one-half of the population will carry some form of voluntary insurance and in the words of Dr. Paul Hawley "This is convincing evidence that voluntary insurance is within the reach of practically every self-supporting individual in the United States."

At a meeting of the Northwest District Medical Society, April 27, 1950, that district society voted to approve the North Dakota Physicians Service, which of course is the State Association sponsored Blue Shield program. The program and policy is available now to all sections of North Dakota with the exception of the area comprising the Sixth District Medical Society.

It is hoped that the doctors of the state will avail themselves of every opportunity that presents itself to encourage their patients to enroll themselves in some voluntary hospital and medical service plan.

W. E. G. LANCASTER, M.D., Chairman

Rural Health

The Committee on Rural Health held one meeting, at Fargo, March 4, 1950, at the Gardner hotel. The members present were Dr. D. J. Halliday of Kenmare, Dr. B. W. Maloney of LaMoure, and the chairman.

Chief subject for discussion at this meeting was the Rural Health Councils. The committee recommends that continued efforts be made to organize rural health councils throughout the state. It was thought that if a sufficient number of local health councils could be organized, their work could be coordinated by some sort of state organization.

A rural health council was organized in Grant county last fall. Invitations for a preliminary meeting were sent out to all persons and organizations thought to be interested, such as board of county commissioners, county superintendent of schools, superintendents of other schools in the county, churches, attorneys, American Legion, American Legion Auxiliary, homemakers clubs, 4-H clubs, infantile paralysis committee, crippled children committee, farm organizations, etc.

At the preliminary meeting, rural health problems were discussed, and the individuals present indicated that they were extremely interested in organizing a permanent health council, for the purpose of studying state facilities in preventive medicine.

A permanent organization was set up at a meeting held three weeks later at the county seat, at which time officers were elected consisting of a chairman, a vice-chairman, secretary and treasurer and a reporter. Plans were made to prepare a constitution and by-laws for the organization. A group of citizens were selected at this meeting to appear before the county commissioners for the purpose of requesting the rehiring of a county nurse and the appointment of a county health officer.

These citizens meeting with the county commissioners met with partial success. A county health officer was appointed, but the rehiring of a county health nurse was taken under advisement.

Because of the severe winter and resulting impassable roads in many localities, no further meetings of the health council in Grant county have been held, and no further meeting will probably be held until sometime in April.

Judged from the experience in Grant county, it appears that there are many people interested in the organization of a rural health council, but that they wait for their local doctors to take the initiative in the organization of such a health council. It was also found that full 80 per cent of those most interested in the forming of a health council are the mothers.

It would seem, too, that county officials are somewhat reluctant to cooperate in assisting any health program requiring the expenditure of the taxpayer's money unless the taxpayer, himself, requests it.

In establishing a rural hospital, its sponsors often lose sight of the cost of operating such a hospital after it is set up. From the experience gained so far, it would appear that the cost of yearly operation is at least one-third of the total cost of constructing and equipping the hospital. If a rural hospital is to be successfully operated, its operating cost is an important factor that must be recognized and taken fully into consideration by its sponsors.

While the successful operation of a local hospital is essentially a matter of proper doctor-patient relationship, it also requires the right kind of cooperation by the community and this community cooperation, in turn, depends in large part on the right type of public relations developed by the doctors and hospital management.

Since the war, an ambitious rural hospital building program has been inaugurated in North Dakota. Several new hospitals have been built, more are being constructed, and others are being planned or considered.

Under the Hill-Burton Act, however, but two hospitals have been constructed and placed in operation with federal aid. These two are the hospitals at Elgin, which received aid only in the purchase of equipment, and the Hettinger hospital. The hospital at Hazen was completed without federal aid before the act went into operation. It is gratifying to learn that these three hospitals are all operating in the black.

Federal Aid money already spent or allocated since the Hill-Burton Act became effective amounts to approximately $595,000. Money available for 1950 amounts to $473,000.

Rural hospitals now being constructed under the Hill-Burton Act are Watford City, Bowman, and Cooperstown. Bids are being opened on hospitals at Maddock and Lisbon. New hospitals are to be built at Ashley, Wishek and Linton, and applications for aid under the Hill-Burton Act are pending.

Hospitals now being constructed without federal aid are located at Mott, Richardton, Mohall, Gackle, Turtle Lake and Michigan. In all, in hospitals already built and in operation, some 87 beds have been added to present hospital facilities in the state. The other hospitals in the process of building or which are planned will add approximately 224 beds.

M. S. Jacobson, M.D., Chairman

Veterans Medical Service

The following is the report of the chairman of the Sub-Committee on Veterans Medical Service of the Committee on Medical Economics of the North Dakota State Medical Association:

The program of the North Dakota Veterans Medical Service enters its fourth year of operation and the report submitted herewith is for the calendar year 1949. Mr. John Fox remains our director and in general the activities appear to be satisfactory in most phases of the operation.

We have continued our efforts for reimbursement of claimed losses in operations of the Medical Service Division. The voucher for the claimed loss for the fiscal years 1948 and 1949 in the amount of $582.12 was paid by the Veterans Administration Center, Fargo, North Dakota, November 21, 1949. The voucher for the fiscal year of 1947 in the amount of $1811.08 was of necessity forwarded to the General Accounting Office in Washington, D.C., since that amount would be paid from a lapsed appropriation and the Fargo agency has no authority to make such payment. It is believed that payment in this amount will likewise be made and, if and when this is done, it is then hoped that arrangements can be made to carry the office on a cash basis with a guarantee by the Veterans Administration that our office would suffer no loss.

The administrative program has gone on smoothly enough with the usual number of cancellations resulting from the severity of the weather and changes of address on the part of the veterans. The total amount of authorizations issued in the calendar year of 1949 is in a lesser amount than the amount issued in the calendar year of 1948.

	Authorizations	Amount Vouchered	Amount Paid to Doctors
1948	$93,600.27	$81,643.33	$74,012.77
1949	65,978.15	60,730.38	56,035.41

The amount vouchered is actually less than required to operate the office on a paying basis and we hope we can get on a cash basis with the Veterans Administration soon.

Our relationships with the Veterans Administration continue to be on a very cooperative and satisfactory basis. It is recommended that the home care veterans administration plan be retained in the state of North Dakota with continuing efforts to get the program on an even financial basis.

R. B. Radl, M.D., Chairman

SPECIAL COMMITTEES

The following reports of Special Committees were referred to the reference committee to consider the reports of the President, Secretary, and Special Committees:

Emergency Medical Service

A meeting of the Committee on Emergency Medical Service has not been held for there have been no apparent emergencies requiring action by this special committee. A meeting is planned to be held in Grand Forks at the time of the state medical meeting.

In behalf of the committee it was suggested that local medical societies organize their physicians in the larger cities and communities so that they will be prepared in the event of a local catastrophe with many casualties such as may occur in major fires.

The medical aspects of atomic warfare has been a major concern of the Council on National Emergency Medical Service of the American Medical Association. Our state had three physicians, one from the State Health Department, one from the North Dakota State Medical School, and one from the State Radiological Society, represented in the course given March 27 to 31, 1950, by the Atomic Energy Commission in their program of indoctrination of the entire physician population in the medical aspects of atomic warfare. This latter program promises to be, in the future, one of the major projects of this committee.

The following is the report of Dr. H. M. Berg, who attended the atomic energy course at the Argonne Laboratories on the Medical Aspects of Atomic Warfare:

"An atomic bomb explosion over any North Dakota city would cause practically complete destruction of that city and the greater part of the population would be injured and a considerable number killed. Such an explosion causes the following types of injury: (1) Air blast effect due to the explosion; (2) Secondary air blast injuries due to falling buildings and flying missiles from the explosion; (3) Severe burns caused by radiant heat from the explosion of the atomic bomb; (4) Flame burns to people trapped in burning wreckage; (5) Radiation injuries.

"The explosion would almost completely destroy all buildings, render all utilities such as water, sewer, electricity, gas and telephones, useless, and set a large number of fires. The streets would be filled with rubble, making it impossible for extensive rescue or fire fighting to be done until some of the main streets had been cleared by bulldozers. All wooden buildings, besides being crushed from the blast, would also catch fire from the heat of the bomb. The hospitals would be destroyed and a large number of the nurses and doctors in that city would be on the casualty list.

"If the bomb were similar to the type used in Japan and were exploded in the air over the city, it would probably be safe for rescue crews to enter the city without fear of receiving too much irradiation. By the time rescue crews could be organized, trained men and equipment from other communities should be available to determine the amount of residual radiation remaining.

"There was very little radiation apparent in Nagasaki and Hiroshima a short time after the bomb explosion. None of the people who entered the city after the explosion in rescue work suffered any radiation damage. New type bombs may leave considerable residual radio-activity.

"The casualty rate for any North Dakota city would be high as all of our cities are small and everyone would be close to the center of the blast. The casualty rate would probably be from 50 per cent to 70 per cent.

"The classification of the injuries would be about as follows: (1) Wounds, 70 per cent; (2) Burns, 65 to 85 per cent; (3) Radiation injury, about 30 per cent.

"These statistics suggest that for any of our large North Dakota cities we would probably have 5,000 to 20,000 casualties. The majority of these would be burns and multiple wounds which would require extensive medical attention. Many of these cases would be in shock and would require plasma and blood.

"The people injured by radiation would be classified in three types: severe, moderate, light.

"Those in the severe type will die in a short time and nothing can be done for them. The individuals in the moderate type will require multiple transfusions, antibiotics, and good care as a considerable number of this group can be saved. No attempt was made to save this group in Japan, as they did not realize that anyone in this group could be saved. Those who receive only a slight amount of radiation do not require any care as they will recover by themselves. However, it probably will be impossible to entirely differentiate the moderate and light groups for some days after the blast. For that reason, most of those in the light group would have to be classified as having received a moderate amount of radiation and be given treatment.

"In the event an atom bomb should be dropped over one of our cities, we should be prepared to set up some type of good emergency communication with other cities in the involved area, as such a bomb would completely destroy present existing facilities. Plans should be complete for immediate mobilization of rescue teams from surrounding communities. These rescue teams should have available heavy equipment for clearing streets. The water system in the involved city probably would be destroyed. Some emergency equipment should be available from surrounding communities to help control the extensive fires which would result from the blast.

"Several depots of emergency medical supplies should be available in various parts of the state. Arrangements should be complete, so that these supplies could be made available in a very short time in the involved areas. The doctors and nurses should be organized, so that a sufficient number could be made available for emergency treatment of the casualties in a very short time.

"After emergency treatment of the injured, a plan should be worked out for their evacuation to undamaged areas where proper facilities would be made available for their treatment. A tremendous amount of blood and plasma would be necessary for the treatment of these patients. The number of hospital beds in the state would not be adequate for the casualties from even one city. Some plan should be worked out for beds for this large number on short notice. The care of these patients will require a well organized laboratory force, as their treatment will have to be guided by the laboratory findings.

"*Conclusions.* An atomic bomb dropped over one of our cities will cause a large number of casualties. Most of the injuries requiring immediate attention will be extensive burns and multiple wounds. About 30 per cent of the casualties will be radiation injuries. Rescue teams, radiation detection personnel, nurses, doctors and medical supplies will have to be brought in from undamaged communities. Arrangements will have to be made for setting up emergency care at the site of the explosion and for evacuation of the more severely injured to other areas for care."

It is planned to have a representative of this committee attend the semi-annual meeting of the Council on National Emergency Medical Service of the American Medical Association to be held in Chicago, on May 6, 1950, at which time the program will be devoted primarily to civil defense.

C. A. ARNESON, M.D., Chairman

Industrial Health

The American Medical Association has offered a 12 point program to meet the challenge and offset the need for the socialization of medicine. One of these points is a greater industrial medical program with emphasis on safeguards against industrial hazards and accidents in the home, on the farm, and on the highway.

Since all of the industries in North Dakota employ less than 500 employees, they have not been able to develop health programs which are within their financial reach. Therefore, it is necessary for the committee on industrial health of the local medical societies to point out the way.

In reviewing the vital statistics for 1949, 20 accidental deaths were recorded occurring in industry as compared with 151 deaths on the highways, 18 in agriculture, 23 in fires and 35 by drowning.

C. J. GLASPEL, M.D., Chairman

Mental Hygiene

At the time of the referral of the following report to the reference committee to consider the reports of the President, Secretary and Special Committees, the following letter was read:

"Dear Mr. Engebretson:

You will recall that I, together with other physicians, was named on the committee of Mental Hygiene for the years 1949 and 1950.

This letter is to inform you that I have never been notified, consulted or had an opportunity to read this report to be made to the Society.

It is also my opinion that Dr. G. S. Carpenter has never been consulted. I will, therefore, not approve nor disapprove the report of this Committee until I have had an opportunity to study it.

This being the fact, I would ask that the report of this Committee not be accepted until all members thereto have had an opportunity to read the same.

A. M. FISHER, M.D., Superintendent,
State Hospital for the Insane, Jamestown, N. D."

* * * *

In order to prepare this report it was planned to have a meeting of the committee in the winter of 1950. The season was so unusually severe that it was considered a hardship on members of the committee to travel in order to meet, and accordingly the meeting was delayed with the expectation that there would be a sufficiently long break in the weather to permit our members to get together. When the Executive Secretary, Mr. E. F. Engebretson, inquired about our report, an attempt was made to call a meeting. On March 8 and 9 we suffered a storm; communications were disrupted and it was impossible to contact all the committee members. Accordingly a meeting and consultation was held by a quorum of the committee from among those who could be reached by telephone on March 9, 1950.

Last year's report published in the JOURNAL-LANCET of September, 1949, indicated that about one-twelfth of the people of the state of North Dakota are emotionally or mentally ill, and that our situation with respect to mental health was not much different to that in the rest of the nation. Attention was drawn to the National Mental Health Act of 1946. Recommendations were made for hospitals being built to put aside several beds for short-term treatment of nervous and mental ailments; the present form of commitment by a quasi-judicial procedure was criticized; it was recommended that the ambiguous word "insane" and the associated stigma be abolished.

Emphasis was put on the establishment of special classes for children in most large towns where such classes could be sustained. Reference was made to the problem of juvenile delinquency.

The attitude of the department of Public Instruction to the examining of our children and the attitude of the Public Welfare Board towards the indigent who are mentally ill was considered. The report referred to the problems that face the judiciary, the North Dakota Penitentiary and the Veterans Administration. It was recommended to the North Dakota State

Board of Medical Examiners that they shall not permit candidates for license to practice medicine to obtain such a license in North Dakota if such candidates do not show some fundamental understanding of the human being as one unit mentally and organically. A brief general outline was indicated for the establishment of clinics for a mental hygiene program for the general population.

Aside from publication of the report in the Journal-Lancet of September, 1949, mimeographed copy of the complete report was sent to both United States senators for North Dakota, both representatives in Congress for North Dakota, the Governor of North Dakota, the members of the Supreme Court, the Board of Administration, the Department of Health, the Department of Public Instruction, the Department of Public Welfare, the Attorney General and many other influential citizens and institutions in our state.

Although the Mental Hygiene Committee of the North Dakota State Medical Association has some ideas with respect to the building of a mental hygiene program for the general population of the state, it was considered advisable to collect a symposium of views from various national authorities with the intention of accepting such advices and ideas as could be useful to the state of North Dakota, and accordingly consultations were held with the following authorities:

Dr. R. H. Felix, of the National Institute of Health, Public Health Service, Washington, D.C.; Dr. John M. Dorsey, Department of Psychiatry, Wayne University, Detroit, Michigan; Dr. George Stevenson, president of the American Psychiatric Association, and president of the National Committee for Mental Hygiene; Dr. Samuel Hamilton, formerly of the U. S. Public Health Service; Dr. W. C. Menninger, formerly lieutenant-general in the U. S. armed services, past president of the American Psychiatric Association, and now with the Menninger Foundation, Topeka, Kansas; The Honorable Minister of Health, Province of Ontario, Toronto, Canada.

The National Health Foundation, Philadelphia, Pennsylvania; The National Committee for Mental Hygiene, Inc., New York; Dr. Winfred Overholser, past president of the American psychiatric Association and now with the St. Elizabeth's Hospital, Washington, D.C.; Dr. Leo H. Bartemeier, secretary, American Psychiatric Association, Detroit, Michigan; Dr. C. C. Burlingame, Institute of Living, Hartford, Connecticut; Dr. Clements C. Fry, Yale University; Dr. Daniel Blain, medical director of the American Psychiatric Association, formerly medical director of the Veterans Administration; Dr. Karl Bowman, former president of the American Psychiatric Association, the Langley-Porter Clinic, San Francisco, California.

A questionnaire was sent to Dr. Francis J. Braceland, Mayo Clinic, Rochester, Minnesota, secretary of the American Board of Psychiatry, but he was not at his office at the time. At the present time of dictating this report Dr. Braceland has written a letter to us indicating that he would be satisfied to consult with us on the subject matter submitted to him.

To repeat, the intention of these consultations was to obtain a symposium of views from national authorities in regard to what is considered a suitable mental hygiene program. The general subjects for discussion hinged on the following propositions: whether such a program could be justified by the money and effort spent; whether such a program could devote itself to examination and diagnosis without therapy; whether such a program should undertake therapy; should such a program be paid for out of public funds or by the individuals who are receiving benefits. Questions as to type of program and types and methods of operating clinics were discussed, including the kinds of indispositions to be cared for; the most practical methods of testing and treating; kind and number of personnel. records, relations with general hospitals; relations with associated and assisting organizations and service clubs; cost and financing; the time element involved in the treatment of one who is indisposed; child problems; family relations; the relationship of such a program to the law and to the courts, and to public instruction in schools. The out-patient care of veterans was discussed and a beginning was made at relevant legislation.

The previously mentioned authorities were very kind in their replies and in their desire to assist the committee. Sufficient material and opinions were obtained so that with application it would be possible to write a book on how to establish a good mental hygiene program. Replies were in some instances voluminous, detailed and decidedly authoritative. The committee intends to investigate the various plans submitted more thoroughly before next year's report.

These things are obvious: a good mental hygiene program for the state of North Dakota is necessary, and the perspective of the people of the state and those who guide them may have to be altered before an efficient and beneficial program is working adequately. It may take five years or maybe ten years before the mental hygiene program is working in North Dakota as well as we should like. Progress is being made; the people, press, radio and state executive departments are becoming more mental hygiene conscious.

About half the hospital beds of the nation and about half the hospital beds in our state are occupied by people who are mentally and emotionally affected. This in itself gives some idea of the magnitude of the problem with which we are faced. When we speak of half the hospital beds in the state being occupied by people who are mentally and emotionally affected, we are likely to forget that about twenty times as many people as are in hospitals are not in hospitals but are sick in the various widespread communities; they are indisposed, miserable, with aches and complaints of psychogenic origin, all in need of skillful and kindly treatment in a mental hygiene program.

In North Dakota during the past year our physicians and the public have become more mental hygiene conscious. The State Board of Health is doing some good work with psychologists; the Public Welfare Bureau has shown an interest in a child guidance clinic at Fargo and at the time of dictating this report is advertising for the services of a full-time psychiatrist; the state hospital at Jamestown is doing good work for those in custodial care. The Department of Public Instruction is conscious of the problem of mental hygiene and personality testing. The State Training School is employing a psychologist commencing June 1, 1950, to assist the able psychologist, Dr. Lloyd G. Thompson, superintendent of the school.

There is a need for coordination and integration. As it is, there is an undesirable likelihood of each agency working independently with the result that much good work may be lost in overlapping and confusion. In view of the magnitude of the problem of Mental Hygiene, as previously indicated, it would be highly advisable that only one agency should be the center for the development, guidance, direction and responsibility for a Mental Hygiene program coordinating or assisting all, the helpful or needy, departments or individuals, for their mutual benefit and the good of all the people of the state.

It is intended to form a North Dakota Committee for Mental Hygiene consisting of approved members of the American Psychiatric Association and other physicians who are sufficiently interested in the subject, and this committee will be allied with the National Committee for Mental Hygiene. This will be a step towards integration, coordination, and we hope for legislation and the acquiring of the necessary appropriations and personnel. A good mental hygiene program can be established in North Dakota in the near future.

R. H. Breslin, B.A., M.D., Chairman

Displaced Physicians

The Committee on Displaced Physicians was appointed as a result of action taken by the North Dakota State Board of Medical Examiners at its January 6, 1949, meeting. At that meeting, held in Grand Forks, the following resolution was passed:

"It was moved that a total of not to exceed eight (8) displaced physicians per year for three (3) years, who have been sponsored by an accredited social agency, be permitted to take the State Board medical examination for a temporary license after first serving a year's general internship in a North Dakota hospital, such hospital being first approved by the State Board of Medical Examiners.

"This license is valid only in a rural community where services are not now available and at a location designated by the sponsoring group and approved by the State Board of Medical Examiners.

"When the displaced physician attains full citizenship, this temporary license may be made permanent by the action and the approval of the Board of Medical Examiners. This temporary license will only apply to displaced physicians as defined by the current Act of Congress."

Under this resolution a number of displaced physicians have been admitted to North Dakota and have been permitted to serve their internship in various hospitals throughout the state.

At the January, 1950, meeting of the North Dakota State Board of Medical Examiners, two of these displaced physicians appeared before the Board. They satisfactorily passed the requirements of the Board and at present are practicing in North Dakota. During the course of a year, a number of displaced physicians have come to North Dakota to take their required internship. The North Dakota State Board of Medical Examiners in many instances has not been notified that these displaced physicians are serving internships in North Dakota and that they intend to apply for permission to take the State Boards in the near future. To remedy this and also to correct some other minor faults, the resolution was amended to read as follows:

"Whereas, the North Dakota State Board of Medical Examiners at their January meeting has reviewed the Displaced Person Physicians program, and

"Whereas, it appears that there have been assimilated as many displaced person physicians for this period as the hospitals can presently take care of without hardship occurring to graduates of medical schools of these United States, and

"Whereas, the presently accredited social agencies contrary to their agreement have brought displaced person physicians into this state without in any way notifying the North Dakota State Board of Medical Examiners, and

"Whereas, the Displaced Person Physicians program was originally instituted to resettle displaced person physicians who were incarcerated in displaced persons camps directly into the state of North Dakota and not to serve as a final resettlement point for all those displaced person physicians whom the accrediting agencies might bring into other states of these United States without assuring them when they were brought to other states of their right to practice medicine in such state,

Now, Therefore, Be It Resolved, that the resolution governing the placement of displaced person physicians be amended as follows:

"After the word 'sponsored' in the fourth line add 'from applicants desiring resettlement from the foreign country in which they were held as displaced person physicians directly to the state of North Dakota.'

"And after the word 'agency' in the fourth line add 'and notice of such sponsored applicant be given in each instance to the Board to determine whether or not there be present facilities for the assimiliation of such applicants,' and

"It Is Further Resolved, that the social accredited agencies be advised that no more commitments be made on their part for placement of displaced person physicians without first notifying and receiving approval from the North Dakota State Board of Medical Examiners."

There has been no formal meeting of this Committee during the year since nothing of any major importance came up which would warrant a meeting of this Committee.

The program at present is functioning very nicely and it is recommended that this committee be kept as a permanent committee as long as the problem of displaced physicians confronts us.

O. A. SEDLAK, M.D., Chairman

Nursing Education

There having been no urgent problems presented by the Nurses Association this year, your Committee on Nursing Education has not met. Your chairman, however, has been kept in touch with the nursing situation through the state office. A representative of the state office has attended nursing group meetings.

G. W. TOOMEY, M.D., Chairman

Report of Delegate to the National Conference of County Medical Society Officers

(Atlantic City, June 1949)

The following report was referred to the reference committee to consider the reports of the President, Secretary and Special Committees:

The following is a brief summary of some of the activities and talks that were given at the meeting of the National Conference of County Medical Society Officers, which was held at Atlantic City, June 5, 1949. More than two hundred persons, most of whom were county medical society officers, attended the panel discussions and over five hundred doctors and their wives were on hand to hear Senator McClellan and Mr. Whitaker. On Saturday evening, June 4, a social hour with banquet was given by Dr. A. M. Mitchell, conference chairman. Most of the panel discussions were held on Sunday morning.

Panel I. Is your Society prepared to care for emergency calls? Moderator, Mr. Theodore Wiprud, secretary, Medical Society of the District of Columbia, Washington, D.C. Three subjects were discussed: (a) an active emergency call plan; (b) plans for a small county society; and (c) twenty-four hour telephone answering service.

Of most interest to the local society of North Dakota was the plan discussed by James A. Biggins, M.D., chairman of the committee on economics, public relations, Mercer County Medical Society, Sharpsville, Pa. In general, the plan was to have some central place where the calls could be taken and doctors available to make calls. In one town, the doctors agreed that they would designate among themselves one doctor to make calls while the others are away. In the other community, the hospital was designated as the central call center and the doctors were placed voluntarily on a rotating call list. In general, these plans seem to work out very well in this community.

Panel II. Does your Society have an indigent medical care plan? Moderator, W. Andrew Bunten, Sheyenne, Wyoming. Three plans were discussed: (a) Maryland Medical Plan program; (b) the Washington State program; and (c) the County Society plan. There was much discussion pro and con these different plans.

The high-lights of the meetings were the talks given by the Honorable John McClellan, United States Senator from Arkansas, and Mr. Whitaker. Both gave excellent presentations on the subject of Compulsory Health Insurance. I am sure that we can count on the influence of the Honorable John L. McClellan to defeat any government health plan that may be submitted.

JOHN H. BOND, M.D., State Delegate

Report of Delegate to the American Medical Association

(Atlantic City, June 1949)

The following report of the Delegate to the American Medical Association was referred to the reference committee to consider the reports of the Council, Councillors, Delegate to the American Medical Association, and Member of the Medical Center Advisory Council:

Delegate attendance, needless to say, was excellent. Your delegate attended all sessions of the House of Delegates and as many informal sessions as possible with the thought of obtaining as much information as possible concerning the problems of other sections of the country and comparing them to our problems in North Dakota. I am convinced that we in North Dakota are indeed far better off from the standpoint of patient-physician relationship and public relations than men in large industrial areas or those of the deep south.

Meetings of the House of Delegates were interesting and efficiently run. Many resolutions were submitted, most of which were disposed of with a minimum of argument. Probably the greatest amount of time was spent considering a resolution by Dr. Wood of Tennessee concerning the care of all veterans and their dependents. This resolution was turned down on its first presentation but because of its far reaching possibilities in preventing the substitution of one form of socialized medicine by another, was reconsidered. After much argument from the floor it was referred to committee and after further consideration was passed on to the Board of Trustees. It would be well for all members of the Association to read Dr. Wood's resolution, which is quoted as follows:

"Whereas, the Seventy-third Congress enacted a law (Section 706, Chapter 12, Title 38, found in U.S. Code 1940 edition) which reads: 'Provided, that any veteran of any war who was not dishonorably discharged, suffering from disability, disease or defect, who is in need of hospitalization or domiciliary care and is unable to defray the necessary expenses therefor (including transportation to and from the Veterans' Administration facility) shall be furnished necessary hospitalization or domiciliary care (including transportation) in any Veterans' Administration facility, within the limitations existing in such facilities, irrespective of whether the disability, disease or defect was due to service. The statement under oath of the applicant on such form as may be prescribed by the Administrator of Veterans' Affairs shall be accepted as sufficient evidence of inability to defray necessary expenses'; and

"Whereas, this legislation has led to the appropriation of large sums of money (over $1,000,000,000) by the Congress to finance the expansion of existing Veterans' hospitals and the construction of new ones in order to meet the needs of veterans entitled to these benefits; and

"Whereas, a large majority of the admissions to existing Veterans' Hospitals are veterans with disabilities which are not service connected; and

"Whereas, these benefits are not equally accessible to all veterans eligible to them because Veterans' Hospitals are not equally accessible to them; and

"Whereas, the Congress of the United States enacted the Hospital Survey and Construction Act (the Hill-Burton Bill) in 1946 for the purpose of (1) conducting a study of the needs of the civilian population of the nation with respect to hospitals, and (2) to extend federal aid in the construction of needed civilian hospitals wherever needed in cooperation with civilian agencies and local governments; and

"Whereas, the studies that have been conducted show that the nation should be divided into approximately 2,300 hospital services areas in each of which a hospital should be located if one does not exist; and

"Whereas, veterans become civilians when they are discharged from military service and are distributed throughout these hospital service areas in approximately the same proportion as other civilian citizens, and are counted in determining the hospital needs of a hospital service area; and

"Whereas, it would be necessary for a Veterans' Hospital to be located in each of the several hospital service areas for these service benefits to be as accessible to veterans as they would be if administered in civilian hospitals; and

"Whereas, these two federal hospital programs—one by the Veterans' Administration and the other by the Administrator of the Hospital Survey and Construction Act—are in conflict with each other at many points. There are conflicts in basic policies. One seeks to establish large hospitals in large centers, the other seeks to establish hospitals in hospital service areas to make them accessible to the people. There is conflict between the two systems for trained personnel. There is competition for patronage and funds. These conflicts result in the overlapping of services and in many forms of waste; and

"Whereas, if the Veterans' Administration should construct and operate a sufficient number of veterans' hospitals to make hospital service benefits available to all veterans entitled to them under existing laws, it would create a federal hospital system of such proportions as to destroy our civilian system of hospitals; and

"Whereas, it is the desire and purpose of this House of Delegates not to destroy or impair any benefit to which any veteran is entitled under existing laws, but rather to change the form of these benefits in such a way as to make them more readily available to veterans who are eligible to them and to bring their administration into harmony with our civilian system of medical and hospital care and financing; therefore be it

"Resolved, by the House of Delegates of the American Medical Association, that we petition the Congress of the United States to enact legislation which would have the following effects.

"1. Repeal Section 706, Chapter 12, Title 38, of the World War Veterans' Act and substitute therefor a new law with the following provisions: (a) that the Administrator of Veterans' Affairs be authorized and directed to issue to each veteran eligible to receive such benefits, a medical and hospital service contract with a benefit provision in an amount sufficient to cover the cost of (1) necessary hospitalization in a civilian hospital that is approved for service to veterans by the Veterans' Administration and (2) necessary medical and surgical services rendered in such hospitals, on the basis of the fee schedule that applies to veterans with service-connected disabilities; or that the Administrator of Veterans' Affairs be authorized to purchase such a contract from corporations engaged in the sale and administration of such contracts if in his judgment it is feasible to do so; (b) that such contracts cover all diseases and disabilities which require hospitalization except the following: (1) disabilities covered by compensation laws; (2) service-connected disabilities; (3) chronic illness (extending over ninety days); (4) tuberculosis, and (5) mental illness; (c) that veterans with disabilities in the categories mentioned in (b) excepting those covered by compensation laws, be eligible for admission to Veterans' hospitals; (d) that veterans with disabilities which are in dispute as to whether or not they are service connected, be eligible for admission to Veterans' hospitals for study, treatment and adjudication and that the disability then be classified for these benefits according to such judgment; (e) that the eligibility of a veteran to receive the contract mentioned above be determined on the basis of his or her net income and that the net income be determined by the same methods used in determining his or her liability for the payment of federal income tax, and (f) that the veteran be required to file an application for the contract on a form prescribed by the Administrator of Veterans' Affairs, in which the veteran states under oath, the pertinent facts concerning his net income and dependents; and be it further

"Resolved, that the Speaker of the House is authorized and directed to appoint a Committee on Veterans' Affairs of not less than seven Fellows of the Association, whose duty it will be to use their best efforts to bring about the actions above set out."

The greater part of the meeting was concerned with socialized medicine. Undoubtedly, the men we have delegated to work out our destinies on this subject are alert and very capable. Our public relations through Whitaker and Baxter have improved markedly in the past two years. Much remains to be done. One of the most impressive talks on the evils of socialized medicine, and a speech given in a most spectacular and convincing manner was delivered by Irvin S. Abel of England. If he could but tour the country and speak to lay groups in the manner in which he spoke to the House of Delegates, public interest would rise by leaps and bounds.

Probably the highlight of the meeting was the cessation of Dr. Fishbein's services in his official position. Probably this was a necessary move considering his relations in Washington, but it was apparent that many present felt that his dismissal could have been executed in a much less crude manner. He probably "called the time" first and but for his persistent bulldoggedness we might now be in the same plight as our English brethren.

The second highlight of the meeting was probably the approval by the A.M.A. of lay group health insurance plans.

I wish to present the following thought for your consideration. Would it not be better to change our state meeting date to some such time as late June or fall? Our meeting in May is one year after the A.M.A. meeting and six months after the Interim meeting. After that length of time the meat of those meetings is not only cold but moldy and your delegate's report is valueless. Should some measure require action by the State Association concerning a national policy we would be very late.

G. W. Toomey, M.D., Alternate Delegate

Report of Delegate to the American Medical Association

(Washington, December 1949)

It was my privilege as your delegate to attend the Washington Session of the House of Delegates on December 7, 1949.

The complete report of the transactions of the House of

Delegates has been published in the *Journal of the American Medical Association*, in the issues of December 17, 24 and 31.

The outstanding impression gained by your delegate at this session was one of great satisfaction with the aggressive and informed leadership which the doctors of the United States now have in their own organization, the American Medical Association. The Association is engaged in an all-out campaign to protect, not only the doctors, but the citizens of the United States from the evil effects of expansion of socialism and the socialistic substitute, called the welfare state. The doctors of America are in the forefront of this fight and as Dr. Irons stated in his address to the delegates, "In this crisis we cannot delegate our individual responsibilities to others than ourselves." It was clearly apparent, at this meeting, that while the leaders in the A.M.A. can point the direction and do a lot of the work, it is still necessary for each and every individual doctor in his own community to carry on this battle with diligence and vigilance. There is no one in a better position to inform others of this continuing threat to their freedom.

In order that our present effective campaign may be continued the constitution and by-laws of the Association were alteted, so that annual dues now set at twenty-five dollars ($25.00) are to be collected from each member. These dues are being collected through the state and district societies. Payment is obligatory for those who desire membership in the American Medical Association. Subscription to one of the journals and payment of fellowship dues together amounting to twelve ($12.00) dollars is necessary for those who wish to become fellows of the association. Members of the association may attend annual meetings but only fellows may hold office.

Legislation. In general the American Medical Association registered its opposition to the type of bills which call for large appropriations of federal money to be distributed to the states. It has been so often shown that federal money carries with it federal control and that in its distribution very often more thought is given to its effectiveness as a means of changing the social system, than the purpose or the objective for which it was voted by the Congress. There is, of course, a growing realization throughout the country that further extension of federal grants for purposes, which should be cared for locally, is not in the best interest of this country.

Dr. Morris Fishbein has retired as editor of the *Journal of the American Medical Association*, being replaced by Dr. Austin E. Smith. A lifetime pension has been granted Dr. Fishbein.

The name of the magazine, *Hygeia*, has been changed to *Today's Health* and Dr. W. W. Bauer has been named editor.

The Washington office has been expanded, moved to new quarters and a legislative committee of the Board of Trustees has been appointed, which meets frequently to discuss and pass on all proposed legislation. Up-to-date information as to our position on all bills is available through this office to state societies.

Relations with lay-sponsored voluntary health plans. A special committee of the Council on Medical Service with Dr. L. W. Larson of Bismarck as the chairman, met in open session in Washington, December 4 and 5. At their previous meeting the Council on Medical Service submitted to the House of Delegates a report containing twenty principles under which lay-sponsored health plans might be approved by the American Medical Association. Considerable criticism of these principles was presented by different persons to the committee, but no change was made in them, other than the suggestion that they be more accurately defined for the benefit of state medical associations. Your delegate voiced opposition to the general principle of permitting in any way, lay-control of the practice of medicine.

Hospitals in the practice of medicine. A report known as the Hess report was adopted at the previous session of the House of Delegates, recommending certain regulations restricting the practice of medicine by hospitals. Further legal opinion indicated that the proposed regulations would be illegal. Hence, the entire matter was referred to another committee for study and to be reported at the next meeting. This is, also, becoming an important subject and deserves careful consideration by our association.

Grievance Committee. The A.M.A. is on record as favoring the establishment in the various state and district societies, where feasible, so-called "grievance committees," which are organized to hear complaints from patients, regarding matters in which the doctor has, in their opinion, not treated them in the proper manner. This might involve either inadequate or possibly too much treatment or might involve the question of proper fees. Establishment of grievance committees is an effective public relations device to enhance the status of the profession as a whole in the public mind.

W. A. WRIGHT, M.D., Delegate

The Medical Center Advisory Council

The following report of our representative on the Medical Center Advisory Council was referred to the reference committee to consider the reports of the Council, Councillors, Delegate to the A.M.A. and Member of the Medical Center Advisory Council:

The council has had two meetings since the 1949 meeting of the House of Delegates. The first was held at the University on June 28, 1949. There was considerable discussion at this meeting over the desirability of developing intern programs in the hospitals of North Dakota, it being generally agreed that interns tend to establish practices in the state in which they take their internships. The council agreed that the Medical Center should serve as an agency for obtaining interns from various sources of supply with special emphasis on medical students from North Dakota taking their internships in the state. The council recommended that the Medical Center and the State Department of Health cooperate in the selection of health committees in the district health units and the various counties of the state. The problem of funds for the operation of the Medical School was given careful consideration by the council. The 1949 legislature did not appropriate sufficient funds to properly finance the Medical Center Program as approved by the people in the last general election. The constitutional amendment providing for a one mill levy earmarked for the Medical Center could not be spread on the tax roll for 1948. For this reason the Medical Center was in the position of attempting to carry out the mandate of the public without sufficient funds. The council recommended that the State Board of Higher Education borrow money on the uncollected taxes so that the operation of the Medical Center might begin as soon as possible.

The second meeting of the council was held at the University on March 3, 1950. Reports were received from Mr. Page, Dean Potter, Professors Cardy and Fischer, and Mr. Robertson, assistant to President West. These reports indicated that great progress has been made during the past nine months. The new science building has been completed and is now occupied by the Medical School. Dr. Cardy reported that 44 communities have taken advantage of a service in his department of pathology which offers analyses of surgical and autopsy specimens sent in by doctors. Dr. Fischer gave a report on the medical technology program which was organized in September, 1949. Mr. Robertson gave a report on the Division of Nursing Education as prepared by Director Beatrice Horsey. This report indicates that the Department of Nursing Education is developing a complete long-range program which will undoubtedly be of great benefit to the state.

The council gave due consideration at its March 3 meeting to ways and means by which the Medical School might be improved and expanded so that it will meet the minimum requirements of the proper accrediting agencies. Dean Potter presented a tentative estimated budget for the fiscal year, 1950-51. He also indicated that an additional $100,000 is urgently needed to properly equip the new Science building. Inasmuch as it is conservatively estimated that the one mill levy will produce over a half million dollars during 1950 and no money has been borrowed to date, the council passed a resolution urging the University administration to approve "an adequate budget within the Medical Center which will assure an approved two year medical school."

Mr. Page, director of the State Medical Center, reported that $42,850 had been granted to the Medical School by the North Dakota Cancer Society for cancer research; $13,000 had been made available by the Veterans Administration for research in fungus diseases; $5,000 had been granted by the U. S. Public

Health Service for cancer training; and $200 had been contributed by the Alpha Phi sorority of the University to begin a research fund on heart diseases. These funds will make it possible for the various departments in the Medical School to institute an extensive research program.

The council has given much consideration to the extent of the medical education program that North Dakota can afford with the funds available. The council agreed to recommend that a survey be made as soon as possible by representatives of the proper accrediting agencies, such as the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. Representatives of these two agencies are scheduled to visit the Medical School during the first week in April. Their report will be awaited with great interest.

Other resolutions passed by the council on March 3, 1950, called for cooperation by the Medical Center and the Public Health Council in developing additional public health facilities in Dickinson and Williston, and other parts of the state as interest and need appears. The council recommended that funds be made available to the North Dakota Dental Association for symposia or state-wide refresher courses in dentistry.

Comments. It is evident that great strides have been made in the development of the State Medical Center during the past year. The advisory council and the University administration seem agreed that every effort should be made to improve and expand the present two-year medical school so it will meet the approval of the proper accrediting agencies. It would appear that the funds available from the one mill levy will cover the cost of this objective. It is doubtful, however, that it will permit expansion to a four-year medical school. The report of the consultants from the American Medical Association and the Association of American Medical Colleges will undoubtedly influence the attitude of the Council and the University administration in this regard.

L. W. Larson, M.D., Member
Medical Center Advisory Council

NEW BUSINESS

Dr. Woutat made the following remarks and introduced the following resolution which was referred to the reference committee on Resolutions and New Business:

I am appearing for the Radiologic Society of North Dakota regarding a resolution that we have passed which was requested to be presented to the House of Delegates. In discussing this with some of the members of the House this afternoon, it was decided to present it with a little background because it involves certain actions. Accordingly, I will try to give some of the background of this resolution.

As you know, for many years there has been controversy between hospitals and physicians regarding the tendency of certain hospitals to invade the field of medicine. Infringements have been usually on pathology, radiology, anesthesiology and physical medicine. The controversy has gotten to the point where the House of Delegates of the American Medical Association last spring adopted a committee report of the Committee on Hospitals and the Practice of Medicine (Hess committee). This report reiterates a good many of previously established principles of medical ethics. It differs in the previous standards and recommendations on three points which are of considerable importance and which concern our resolution. The following are the features embodied in this report:

1. The recommendation that constituent state and territorial medical societies appoint committees on hospital and professional relations to be available to receive complaints with reference to professional or economic relationships existing between physicians and hospitals or medical schools.
2. The recommendation that if local compromise of the complaint be impossible, charges of unethical conduct on the part of either members of the professional staff or hospital management be brought before the Judicial Council of the American Medical Association for examinations.
3. The recommendation that the Judicial Council "order the withdrawal of the Association's approval" on an institution found guilty and not willing to cooperate within ethical and legal limits.

The third item has created considerable controversy. There was considerable question raised as to whether it might not be in conflict with federal law. Accordingly, after it was passed, it was reconsidered and it was decided to re-refer it back to the committee for rewording. It will again be presented to the House of Delegates of the A.M.A. Following the passage of that resolution last June, there were some very bitter editorials in some hospital journals regarding this Hess report. In March, 1950, the American Hospital Association passed some resolutions and by the wording of this resolution it was obvious that the Board of Trustees of the American Hospital Association are determined to absorb the practice of radiology, pathology, anesthesiology, and physical medicine as a part of hospital service. Accordingly, the radiological societies in various states have adopted a resolution, and have recommended that other states do the same, and present this resolution to the House of Delegates of the State Medical Association for consideration. The following is the resolution:

Whereas, the practice of medicine by lay organizations, both individual and institutional is becoming of increasing and grave concern, and,

Whereas, a resolution adopted by the Board of Trustees of the American Hospital Association in March, 1950, indicates their consideration of absorption of the services of radiology, pathology, anesthesiology, and physical medicine as hospital services, and

Whereas, it is illegal, with some exceptions and unethical for any lay corporation to practice medicine and to furnish medical services for a professional fee which shall be so divided as to produce a profit for a lay employer, either individual or institutional, and

Whereas, the House of Delegates of the American Medical Association meeting in Atlantic City, New Jersey, in June, 1949, adopted the report of the Committee on Hospitals and the Practice of Medicine (Hess committee) as amended by the reference committee on the Report of the Board of Trustees, and

Whereas, the House of Delegates of the American Medical Association meeting in Washington, D.C., December, 1949, re-referred the above report to the Committee on Hospitals and the Practice of Medicine (Hess committee) for rewording, and

Whereas, this report contains recommendations and modes of procedure calculated to eliminate the above and other differences between doctors of medicine and hospitals, and/or medical schools, which are contrary to the public welfare;

Now, Therefore, Be It Resolved: That the North Dakota Radiological Society meeting in Fargo in April, 1950, record its support of the principles set forth in the Hess report, and

Be It Further Resolved: That this action of the North Dakota Radiological Society be transmitted at once to the North Dakota State Medical Association requesting the North Dakota State Medical Association to support the North Dakota Radiological Society in their position as favoring the principles of the Hess report, and that the North Dakota State Medical Association appoint a committee on Hospital and Professional Relations, or delegate the functions of such a committee to an appropriate standing committee, and

Be It Further Resolved: That the delegate of the North Dakota State Medical Association to the House of Delegates of the A.M.A. meeting in San Francisco in June, 1950, be advised of this action, and be requested to lend the support which his best judgment indicates necessary to adopt the principles of the Hess report in a form that will be consistent with federal and state law, and will endorse the principles of medical ethics of the American Medical Association.

Philip H. Woutat, M.D., President,
North Dakota Radiological Society

Supplemental Report of Committee on Emergency Medical Service

The following supplementary report of the Committee on Emergency Medical Service was introduced by reading and referred to the reference committee to consider the reports of the President, Secretary and Special Committees:

On the 6th of May, 1950, as chairman of the Committee on Emergency Medical Service and only representative from North Dakota, I attended the meeting of the Council on National Emergency Medical Service of the A.M.A. at Chicago.

The meeting was devoted almost exclusively to the problem of civilian defense with special reference to atomic warfare. The papers presented and discussions led were primarily by members of Health Resources Divisions of the National Security Resources Board; also there were representatives from the Atomic Energy Commission.

Numerous reprints, outlines, brochures, etc., relating to civilian defense were turned over to the office of the Executive Secretary of the North Dakota State Medical Association where they may be available for review.

In brief outline, the following are some of the highlights which I gathered from papers presented, panels and informal discussions.

1. Attempts are being made to have the United States develop as fast as possible a program of civilian defense. (Actually *this seems to be as big a part of the present cold war as any.* It was brought out how England, only through their program of civilian defense started more than five years before the actual war, was able to continue through the dark days of war.)

2. Civilian defense will be primarily a state problem. It is desired that each state have a state civilian defense director and that state legislative enactment measures be adopted as soon as possible. (It was emphasized that this is a civilian problem and that help from the military services or federal aid is not to be expected. The civilian population must be ready to take care of themselves.)

3. The problem of civilian defense will be the primary responsibility of the medical profession. There are now NSRB-AEC training programs underway, to instruct as many as possible of the medical profession in atomic warfare defense. (Three members of our state have already attended one of these training programs and are ready to present their knowledge to members of our state. It is planned to dispel some of the hysteria of the atomic bomb and show that there is some time for first aid with hope of recovery. This was brought out by a major who had witnessed three atomic explosions.

4. Foremost among the many problems in civilian defense are those to do with supplies, methods of treating burns, provision for whole blood, decentralization with dispersion.

5. In the next war there will be a greater conservation of physicians. Many more will be needed for civilian defense. There will be no idle months of physicians doing nothing or performing non-professional tasks, but their professional ability will be utilized to the utmost.

6. What is the status of North Dakota in the present plan? It seemed to be the general opinion that North Dakota and some of the mountain states would have little to worry about in regard to an atomic bomb explosion. Nevertheless, it was thought advisable to have the physicians trained in atomic defense so that they might help others if necessary. Maine, which leads the country in the present civilian defense program, has only about 200,000 more than North Dakota in the last census and at the present time is not any more strategically located than North Dakota.

After attending the meeting it would be my recommendation:

1. That North Dakota physicians join the nation in developing a state civilian defense plan.

2. That North Dakota physicians become acquainted with National Security Resource Board and Atomic Energy Commission Training program for physicians in atomic warfare.

I should be pleased to report further on civilian defense in person or by letter to any medical society or component body of the North Dakota State Medical Association.

CHARLES A. ARNESON, M.D., Chairman

Dr. T. E. Pederson spoke and introduced the following resolution which was referred to the reference committee to consider the reports of the Standing Committees:

"I think this would bear worthy discussion among the committee members of the Committee for Public Policy and Legislation. I specifically submit this as the recommendation of the Stutsman County Medical Society as a supplementary plan in the combating of our ever present problem, namely, socialism:

RESOLUTION

"In April the Stutsman County Medical Society invited ten Jamestown business men to be present at a banquet meeting to give their views as to additional ways to fight socialism and to enlist their active support in such a program. The conclusions of the entire group are embodied in the following resolution unanimously accepted by the Stutsman County Medical Society.

"Resolved, that the overall problem is not socialized medicine alone but socialism in all its forms, and

"Whereas, the more ways we employ and the more agencies we have waging the battle, the greater is our chance of victory, therefore, let us look for other methods in addition to what is now being done, and

"Whereas, the battle is being waged adequately on the national scale and in Washington through lobbying as carried on by the American Medical Association, are we doing our part on the local level? Are we organized for action in converting other people and if so, are we and our converts enthusiastic enough to vote? The difference between victory and defeat for Smathers in Florida was the organizing, the convincing, and the selling of this idea by the medical men and the medical auxiliary to the people of the state. Apparently, they thought the problem important enough to get in and dig. They were organized for battle on the local level; meaning direct contact between doctor and his friends and the patients; discussion and speeches in the communities by the doctors; enormous personal letter campaigns from doctor to the patients not directly contacted.

"Now, Therefore, Be It Resolved, that we, as doctors and citizens, talk as much against socialism in all its forms as against socialized medicine. We can effectively combat state sold insurance, state operated current plants, and socialized agriculture.

"We should be cooperating with the insurance men of the state, exchanging facts and talking points with them, so that we might campaign actively against their problem and so that they might do likewise for us. There are other organizations that need our cooperation and our leadership. Certainly Mr. Citizen will more readily accept the fact that socialized insurance is undesirable from his doctor, supposedly an impartial observer, than from his insurance man.

"Be It Further Resolved, that the State Medical Association be organized to assist the county societies in organizing their local campaigns by stimulating enthusiasm locally through outside speakers; sending "canned" speeches for local men to give; writing newspaper articles to be carried in the local papers. Many newspaper men in the state recognize the importance of this battle and will print these articles free of charge as a public interest, and

"Be It Further Resolved, that the doctors in the separate county societies be enthusiastic enough and active enough to make their society, in effect, the local leader in organizing and enlisting the aid of other groups in each community. This group, which includes the county medical society, the insurance men, the American Legion and others, individually or as groups could form a strong voting block in county and state politics to support non-socialist measures and candidates. The strength of this organization could be reflected in the eyes of the local and state politicians as votes.

"Be It Further Resolved, that the State Medical Association not only accept and endorse these resolutions, but also provide an active campaign in carrying out this program."

The following resolution was referred to the reference committee on Resolutions and New Business:

RESOLUTION

Resolved, that a committee from the State Medical Association be appointed to confer with the State Insurance Commission regarding investigation of the various small "fly-by-night" health insurance companies, and a more strict supervision be made of them. This should be done, particularly in regard to the unethical methods of selling used by these health insurance companies.

Devils Lake District Medical Society.

The Speaker announced that the next order of business would be action upon several amendments to the Constitution which were introduced at the 1949 meeting and laid on the table, pursuant to the constitutional provisions for the amending of the Constitution.

It was moved, seconded and passed, that Article V, Section 1 of the Constitution be amended to read as follows:

"The Council shall be the Executive Body of the Association and shall consist of one Councillor from each Councillor District" (balance of section to remain the same).

It was moved, seconded and passed that Article IX, Section 1, of the Constitution be amended to read as follows:

"The officers of this Association shall be a President, a President-elect, a First Vice-President, a Second Vice-President, a Secretary, a Treasurer, a Speaker of the House of Delegates, a Vice-Speaker of the House of Delegates, and one Councillor from each Councillor District."

It was moved, seconded and passed that Article IX, Section 3 of the Constitution be amended to read as follows:

"The Speaker and the Vice-Speaker of the House of Delegates shall be elected by the House of Delegates at its second session each year. Each may, but need not be, elected from among the members of the House of Delegates."

It was moved, seconded and passed, that Chapter IV, Section 5, of the By-Laws be amended to read as follows:

"The Speaker, and in his absence, the Vice-Speaker, of the House of Delegates shall preside at the meetings of the House of Delegates and shall perform such duties as custom and parliamentary usage require of a presiding officer. He shall have the right to vote only when his vote shall be the deciding vote."

Inasmuch as these amendments were introduced at the second session of the 1949 meeting this action was proper and final action.

It was moved, seconded and passed, that Chapter XIII, of the By-Laws be amended to read as follows:

"These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session. Any such amendment may be introduced at any session of the House of Delegates but shall be laid on the table for that current session, but may be acted upon at any later session of the House of Delegates."

This amendment was introduced in the final session of the 1949 meeting and was up for final adoption.

The following new proposed amendment was introduced and referred to the reference committee on Resolutions and New Business:

"The annual assessment for resident members who have retired from practice of medicine, and non-resident members who have retired, and non-resident members in active practice who do not stay outside the state of North Dakota for a period in excess of two years, shall be $10.00 per capita unless otherwise ordered by the House of Delegates."

The following proposed amendment to Chapter VIII, Section 1 of the By-Laws was introduced and laid on the table for final action in the second session. Said proposed amendment reads as follows:

"The Committee on Scientific Program shall consist of six members of this Association, appointed by the President of this Association; two of which shall be appointed to three-year terms; two of which shall be appointed to two-year terms; and two of which shall be appointed to one-year terms. All successors to the original terms shall be appointed by the President for a term of three years each. The Committee shall hold its first meeting on or before the second Tuesday in December at which time it shall consider all suggested speakers for the scientific program, submitted by the members of this Association. The committee shall select at least twenty-five per cent of the speakers on the scientific program from members of the Association, if practicable, and if there are not sufficient suggested local speakers to meet this quota, the committee shall be authorized to request presentation of such papers from individuals who are members. It shall determine the character and scope of the scientific proceedings of the Association, subject to the provision of instructions of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the Association as nearly as is practicable."

Dr. Radl announced that the Sixth District Society had instructed its delegates to bring before the House of Delegates the need for standardization of insurance report forms. The solution of this problem was referred to the Council and the appropriate committees of the Association.

The next order of business was the setting of the annual dues which, after a short discussion, were set at $50.00 for the year 1951.

Nominating Committee

The Speaker announced the appointment of the following members to the Nominating Committee: E. M. Haugrud, chairman, Fargo; M. S. Jacobson, Elgin; R. F. Gilliland, Carrington; A. D. McCannel, Minot; C. J. Glaspel, Grafton.

Adjournment

The first session of the House of Delegates was adjourned at 10:15 P.M. to reconvene at 2:00 P.M., May 28, 1950. The motion carried.

SECOND SESSION, HOUSE OF DELEGATES

Sunday Afternoon, May 28, 1950

The Second Session of the House of Delegates was called to order by the Speaker, Dr. A. E. Spear, at 2:00 P.M., in the Dacotah room of the Dacotah hotel, Grand Forks, North Dakota, May 28, 1950.

The Secretary called the roll. Seventeen delegates responded and the Speaker declared a quorum present. The following delegates were present:

Drs. W. R. Fox, alternate, Devils Lake; E. M. Haugrud, Fargo; A. C. Fortney, Fargo; C. V. Bateman, Wahpeton; T. Q. Benson, Grand Forks; R. W. Vance, Grand Forks; A. K. Johnson, alternate, Williston; A. R. Sorenson, Minot; D. J. Halliday, Kenmare; W. H. Gilsdorf, Valley City; R. B. Radl, Bismarck; M. S. Jacobson, Elgin; R. O. Saxvik, Bismarck; R. W. Rodgers, Dickinson; T. E. Pederson, Jamestown; H. A. LaFleur, Mayville; R. F. Gilliland, Carrington.

The reading of the minutes of the first session were dispensed with upon motion of Dr. Rodgers, seconded by Dr. Vance, and carried.

Selection of 1951 Meeting Place

The Speaker announced that he would be glad to entertain an invitation for a place for the 1951 meeting to be held. Dr. R. B. Radl stated that the Sixth District Medical Society extends a cordial invitation for the Sixty-fourth Annual Meeting to be held in Bismarck, in 1951. Upon call by the Speaker for other invitations, Dr. W. A. Wright introduced to the House of Delegates, Dr. R. G. Mayer, Secretary of the South Dakota State Medical Association, and Dr. Rudolph of Aberdeen, South Dakota. Dr. Mayer extended an invitation for a joint meeting with the South Dakota State Medical Association, making the following remarks:

"Twenty years ago a delegation from South Dakota met with the North Dakota State Medical Association and invited you to join with us in a session at Aberdeen on our fiftieth anniversary. I remember the event very well. We had a very fine meeting and a large delegation from North Dakota. Next year is our seventieth anniversary of organized medicine in the Dakotas. South Dakota has chosen Aberdeen again as our meeting place. We would like to have North Dakota join with us again at a joint session. I think it would be mighty fine if the North Dakota and South Dakota men could get together more often and become better acquainted. We have about the same area in geography, the same population, same number of cities about the same size. Our economy depends upon agriculture which gives us about the same medical problems and the same economical problems. I believe we could have a much better scientific program and exhibits by having a joint session. Twenty years ago when we met at Aberdeen we did not have the facilities at Aberdeen that they have now. We have a large arena and auditorium which would be ideal for the exhibits. Our hotel accommodations are adequate to take care of a large meeting. We extend that invitation to you and we would like to have you give it your earnest consideration and let us know what you decide. Both of our associations have executive secretaries and staffs so that they can take care of a lot of details that make a convention a success."

It was moved by Dr. Radl, seconded by Dr. Fortney, and carried, that the matter of choosing the meeting place for the 1951 session be referred to the Council.

Dr. Wright expressed the appreciation of the North Dakota State Medical Association for the invitation tendered by the South Dakota delegation and assured them that it would receive due consideration.

Election of Officers

Dr. E. M. Haugrud, chairman of the Nominating Committee, presented the following report. The Speaker announced that there was nothing in the report of the committee that precluded additional nomination of officers from the floor and inquired as to whether any additional nominations were to be made. Hearing none he declared that a motion would be in order to declare the nominees duly elected to their respective offices. On a motion made that the nominees be elected unanimously, which motion was seconded, all voted aye and the following officers were elected unanimously:

President—L. W. Larson, Bismarck.
President-elect—W. E. G. Lancaster, Fargo.
First Vice-President—O. W. Johnson, Rugby.
Second Vice-President—J. Sorkness, Jamestown.
Speaker of the House—A. E. Spear, Dickinson.
Vice-Speaker of the House—G. A. Dodds, Fargo.
Secretary—O. A. Sedlak, Fargo.
Treasurer—E. J. Larson, Jamestown.
Delegate to A.M.A.—W. A. Wright, Williston.
Alternate Delegate to A.M.A.—G. W. Toomey, Devils Lake.
Councillors: First District—J. F. Hanna, Fargo; Third District—C. J. Glaspel, Grafton; Sixth District—R. H. Waldschmidt, Bismarck.
Board of Medical Examiners—A. E. Spear, Dickinson; W. A. Wright, Williston; F. E. Weed, Park River.
Member: Medical Adivsory Board—L. W. Larson, Bismarck; State Health Council—W. A. Wright, Williston.

REPORTS OF REFERENCE COMMITTEES

Reference Committee to Consider the Reports of the President, Secretary, and Special Committees

Dr. C. V. Bateman, chairman, presented the following report which was adopted section by section, and as a whole:

1. *Report of the President*: This committee wishes to commend the very able work of the President, Dr. W. A. Wright, in his excellent efforts toward unifying the work of the Association during his term of office. His wide-spread contacts and numerous personal reports in many districts bespeak the great energy and effort he has demonstrated in fulfilling his office.

2. *Report of the Secretary*: Commendation of the North Dakota Association is due Secretary O. A. Sedlak for a clear, detailed and concise report. Outstanding among the Secretary's findings are the high paid-up membership, indicative of renewed energy in the medical interests of North Dakota. It is exceedingly gratifying to note that 86.8 per cent of our state membership have been keenly aware of the great political problem confronting our national A.M.A. The many meetings our Secretary has attended is indicative of his interest. This committee agrees with the recommendation of the Secretary to continue the office of the Executive Secretary.

3. *Report of Committee on Emergency Medical Service*: Among reports of Special Committees, the Emergency Medical Service Report of Dr. C. A. Arneson is of vital importance to the understanding of the needs of civilian defense. This is primarily a medical problem. His report and supplementary report gives some fine detail. His offer to meet and report further in detail to the medical groups of the state should be made use of.

4. *Report of Committee on Industrial Health*: The report of the Committee on Industrial Health has been reviewed. This reference committee recommends its continuance.

5. *Report of Committee on Mental Hygiene*: A quorum of the Committee on Mental Hygiene was able to have a meeting in spite of adverse weather conditions. Dr. R. H. Breslin's thorough report covers a broad field. Of particular interest to all physicians is the plan for the adoption of an adequate mental hygiene program that can touch every area of our state by trained experts. The reference committee feels that the screening of our mentally ill before admission to the State Hospital is fairer and is much better medical practice.

6. *Report of Committee on Displaced Physicians*: The report of the Committee on Displaced Physicians was reviewed. It is considered that the medical men of North Dakota have been sincere in their relationship to these incoming physicians. Your reference committee agrees with the resolution of the Displaced Physician's Committee that all further commitments of displaced persons physicians have the approval of the North Dakota State Board of Medical Examiners.

Dr. Glaspel, secretary of the State Board of Medical Examiners, was called upon to recount the experiences of the Board regarding the Displaced Physicians program.

This report of displaced physicians is a long one. It is quite possible that the Board should have given you some report a year ago. Then we, perhaps, could have avoided some criticism directed against us. A year ago last January the Board was asked to grant an audience to two social agencies, namely, the Catholic Rural Life and Lutheran Aid Society. That was granted and these two representatives appeared before us and told their story. Their organization, after screening displaced persons, were going to bring into North Dakota certain displaced persons and there might possibly be some physicians in this group. They asked what would be the attitude of the Board toward these displaced physicians practicing in North Dakota. We called their attention to the fact that full American citizenship was a requisite to practice medicine in North Dakota. The first reaction of the Board was antagonistic and we thought we did not want anything to do with that sort of thing. However, certain events that happened in Minnesota and the publicity attendant on this case regarding a displaced physician there changed our mind and we decided to give this further study. I will say that the two representatives from the two social agencies were most cooperative. We finally brought up a sort of resolution which is a modification of our Licensing Act. This resolution is as follows:

"It was moved that a total of not to exceed eight (8) displaced physicians per year for three (3) years, who have been sponsored by an accredited social agency, be permitted to take the State Board Medical Examination for a temporary license after first serving a year's general internship in a North Dakota hospital, such hospital being first approved by the State Board of Medical Examiners.

"This license is only valid in a rural community where services are not now available and at a location designated by the sponsoring group and approved by the State Board of Medical Examiners.

"When the displaced physician attains full citizenship, this temporary license may be made permanent by the action and the approval of the Board of Medical Examiners. This temporary license will only apply to displaced physicians as defined by the current Act of Congress."

After the displaced physician has served in this community for a length of time to apply for American citizenship, which is from three to five years, he must again come before the Board and at that time we take final action on him, whether or not we consider him a suitable person to practice medicine in North Dakota. We have had two men take the examinations. The poorest paper written by an American graduate is much superior to those written by these two displaced physicians. However, when one considers the medical education in Europe, one can appreciate why these men are very handicapped and a man has to be mentally sharp to come out of a medical school of that kind with as much knowledge as an American graduate.

Our resolution called for a maximum of eight displaced physicians per year for a period of three years. That will give us twenty-four. At the end of that time we might be able to tell a little better what kind of finished product is being turned out. At present we have about ten men, in the state, scattered around through the various hospitals.

7. *Report of Committee on Nursing Education*: The report of the Committee on Nursing Education states no immediate problems. Your reference committee recommends that the Committee on Nursing Education and the North Dakota State Nursing Association have some understanding as to the basis of medical practice from a social and ethical point of view.

C. V. BATEMAN, M.D., Acting Chairman
M. S. JACOBSON, M.D.

Reference Committee to Consider the Reports of the Council, Councillors, Delegate to the A.M.A., and Member of the Medical Center Advisory Council

Dr. W. H. Gilsdorf, chairman, presented the following report which was adopted section by section and as a whole:

1. *Report of Chairman of the Council*: Your reference com-

mittee has reviewed the report of the Council as submitted by Chairman McCannel and printed in the Handbook. Your committee after discussing the amendment to Chapter VIII, Section 1, of the By-Laws, as printed in the Handbook recommends the adoption of the amendment with the recommendation that at least one member of the Scientific Committee be a resident of the city in which the next state meeting will be held.

We are pleased to note in the Council report that the misunderstanding between the insurance profession and doctors arising from newspaper advertising presented by the Blue Cross has been satisfactorily settled.

Your reference committee reviewed and discussed the recommendation by the Committee on Public Policy and Legislation for the establishment of a Grievance Committee. We feel that it would be a good public relations instrument, but the Medical Society should receive more information on such a committee and suggest that the Committee on Public Policy and Legislation seek such information.

2. *Report of the Chairman of the Council's Supplementary Report*: The attention of your reference committee is now directed to the Supplementary Report of the Council given May 27, 1950.

Your reference committee recommends the whole-hearted approval by the State Society of Dr. L. W. Larson's possible appointment to the Board of Trustees of the A.M.A.

Your reference committee has discussed with Dr. Saxvik his plan for a multi-phasic screening program. We recognize that Dr. Saxvik is competent in his suggestions and note that a committee of doctors from the state society will control but not operate the unit. Your reference committee requests the approval of this program.

Your reference committee is in favor of the organization of a Heart Committee, and if formed, recommends that this committee be included in an amalgamation of standing committees.

Your reference committee commends the Council members on their accomplishments during the past year.

3. *Reports of Councillors*: Your reference committee reviewed the reports of the District Councillors and was pleased to see an increased number of good scientific meetings.

4. *Report of Delegates to the A.M.A.*: Your reference committee has considered the reports of the two Delegates to the A.M.A. meetings. We wish to compliment them on their excellent reports and note Dr. Toomey's suggestion to change the date of our annual convention. We feel that this will require further discussion.

5. *Report of the Member of the Medical Center Advisory Council*: Your reference committee has reviewed the report of the member of the Medical Center Advisory Council and submits the following comments made by Dr. L. W. Larson:

"It is evident that great strides have been made in the development of the State Medical Center during the past year. The Advisory Council and the University Administration seem agreed that every effort should be made to improve and expand the present two-year medical school so it will meet the approval of the proper accrediting agencies. It would appear that the funds available from the one mill levy will cover the cost of this objective. It is doubtful, however, that it will permit expansion to a four-year medical school. The report of the consultants from the American Medical Association and the Association of American Medical Colleges will undoubtedly influence the attitude of the Council and the University Administration in this regard."

W. H. GILSDORF, M.D., Chairman
J. D. CRAVEN, M.D.
R. F. GILLILAND, M.D.
A. K. JOHNSON, M.D.
W. R. FOX, M.D.

On motion of Dr. Haugrud, seconded by Dr. Gilsdorf, and passed, the order of business was changed for the purpose of accepting the resignation of Dr. Sorkness as a member of the Council. Dr. Sorkness made the following remarks:

"I appreciate the honor that the House of Delegates have bestowed upon me, in electing me Second Vice-President. I will do the best I can. I believe that it is the custom to tender my resignation from the Council at the present time to accept the office of Second Vice-President."

It was moved by Dr. Haugrud, seconded and passed, that Dr. Sorkness' resignation from the Council be accepted. The Nominating Committee then placed in nomination the name of Dr. Richard Nierling of Jamestown to replace Dr. Sorkness as a Councillor for the Seventh District. The nomination was seconded by Dr. Gilsdorf and passed unanimously.

Reference Committee to Consider Reports of the Standing Committees, Except the Report of the Committee on Medical Economics and its Sub-Committees

1. *Report of Committee on Medical Education*: Your reference committee was impressed by the report of the Committee on Medical Education and feels they deserve to be especially commended. This committee feels that, if in the future a four year medical school is to be considered, thought should be given to the possibility of regional education. We also feel that financial aid to the student should not extend beyond the academic years, but we encourage further exploration as advised by the Committee on Medical Education for coordination of internship and resident training, within the state.

Dr. Leigh, chairman of the Committee on Medical Education, was given the floor to communicate the following information to the House of Delegates:

"Since the report was compiled, the Board of Higher Education requested representatives of the rating bodies of American Medical Schools of the A.M.A. to go to Grand Forks, which they did in March. They made four recommendations which I feel very certain we can fulfill in the not too distant future. One recommendation was a change in one of our existing courses; the other one, public health and hygiene; third, additional work on the library. This, as you know, is being built as fast as possible with appropriations available. The fourth recommendation was for more clinical instruction in the two year medicine. With the construction of the St. Michael's Hospital adjacent to the campus, we feel within the next two years that we can comply with the fourth recommendation. The points that Dr. Vance brought to our attention is the question of subsidation. It was brought up at the committee meeting and discussed. All over the country there has been a great demand for more doctors. In Mississippi they have had much success with the plan of subsidation. It was thought North Dakota might have to resort to this. From the looks of things, North Dakota will be adequately taken care of. We are only about 45 short of adequate coverage of 1949.

"If there are any questions relative to our two year school, I shall be glad to answer them."

2. *Report of Committee on Official Publication*: Your committee has been gratified to see so many publications by North Dakota physicians in our official publication during the past year.

3. *Report of Committee on Necrology and Medical History*: Your reference committee moves the adoption of the report on Necrology and Medical History. (At that time the Speaker announced that the chair would request the House of Delegates to rise for one moment in silent tribute to the members who have passed on. Thereupon followed a moment of silence with all delegates and guests standing.)

4. *Report of Committee on Pneumonia*: Your reference committee was impressed by the report of the Committee on Pneumonia because of the increased mortality over 1948. We feel that it is not a representative picture of this disease because of (1) lack of reporting of this disease; (2) increasing incidence of atypical pneumonia; (3) terminal pneumonia secondary to debilitating diseases.

5. *Report of Committee on Maternal and Child Welfare*: Your reference committee has reviewed the report of the Committee on Maternal and Child Welfare.

6. *Report of Committee on Cancer*: Your reference committee has reviewed the report of the Committee on Cancer.

7. *Report of Committee on Tuberculosis*: Your reference committee has reviewed the report of the Committee on Tuberculosis. We feel that the committee has been especially active in the work being done on detecting and eliminating tuberculosis. For the interest of the society, we feel a report on BCG inoculations should be reported.

8. *Report of Committee on Fractures*: Your reference committee has reviewed the report of the Committee on Fractures.

9. *Report of Committee on Public Policy and Legislation*: Your reference committee wishes to compliment the Committee on Public Policy and Legislation for their untiring efforts in disposing of controversial matters in a most satisfactory manner.

10. *Report of Committee on Venereal Diseases*: Your reference committee has reviewed the report of the Committee on Venereal Diseases.

11. *Report of Committee on Public Health*: Your reference committee has reviewed the report of the Committee on Public Health.

12. *Report of Committee on Crippled Children*: Your reference committee has reviewed the report of the Committee on Crippled Children.

R. W. Vance, M.D., Chairman
George Waldren, M.D.
R. W. Rodgers, M.D.

Reference Committee to Consider the Reports of the Committee on Medical Economics and Sub-Committees on Prepayment Medical Care, Veterans Medical Service and Rural Health

Dr. T. Q. Benson, chairman, presented the following report, which was adopted section by section, and as a whole:

1. *Report of Committee on Medical Economics*:

Your reference committee recommends that the Committee on Medical Economics be commended for its splendid work. A new fee schedule proposed by this committee and approved by the Council of 1950 has been presented to the North Dakota State Welfare Board. The North Dakota State Welfare Board has not thus far accepted the new fee schedule. Until such time as the new fee schedule has been accepted, we recommend that private practitioners charge welfare cases fees which in their own opinion seem proper.

Inasmuch as many old line companies are selling an acceptable policy for medical and hospital care, they feel aggrieved at the Medical Association's endorsement of the Blue Shield Plan only. We, therefore, recommend that companies which sell acceptable policies may also be approved by the Association upon application. We recommend that a committee of three be chosen to examine prepaid medical insurance policies and that this committee be given the power to approve or disapprove such policies, and further that they be empowered to consult with the State Commissioner of Insurance in regard to issuance of licenses to companies selling prepaid medical and hospital insurance. We recommend that the North Dakota State Commissioner of Insurance be requested to avail himself of the services of this committee.

We commend the committee for the alertness in regard to the menace of bills aimed at the socialization of medicine, and further, we urge each member of the State Association to continue the fight against socialism in the territory in which he resides.

2. *Report of Committee on Rural Health*: Your reference committee commends the Committee on Rural Health for its actiivty. We recommend that the doctors in their respective counties associate themselves intimately with any rural health committee which may be formed in order that they may be instrumental in directing the policies of such committees.

3. *Report of Committee on Prepayment Medical Care*: It has come to our attention that Blue Shield will pay only 75 per cent of the liability in cases which are served outside of the state in which the policy was written. We recommend that in cases in which policy holders are stricken unexpectedly with illness outside of their state, the company shall pay the total amount or 100 per cent of the liability. We recommend that the Executive Secretary advise such companies of this proposal.

4. *Report of Committee on Veterans Medical Service*: We commend the Sub-Committee on Veterans Medical Service for their splendid work.

5. *Report of Representative to the National Conference of County Medical Society Officers*: Dr. John H Bond, of District No. 1, who passed away recently, was the delegate to the National Conference of County Medical Society Officers. His report was drawn up in two panels, which included: (1) Is your society prepared to care for emergency medical cases? (2) Does your society have an indigent medical care plan?

This reflects the public-mindedness of American physicians. It is evident from the report that small unit set-ups such as town and country groups, be made available to insure constant medical service.

T. Q. Benson, M.D., Chairman
A. R. Sorenson, M.D.
D. J. Halliday, M.D.

After considerable discussion relative to the possibility of establishing a uniform form for medical reports to insurance companies, it was moved, seconded and passed that the Committee on Medical Economics take this matter up with the North Dakota Federation of Insurance to attempt to work out such a uniform form on a voluntary basis.

Reference Committee on Resolutions

Dr. R. B. Radl, chairman, presented the following report which was adopted section by section and as a whole:

Your Committee on Resolutions wishes to present the following amendment to the By-Laws:

That Chapter VIII, Section 1, be amended to read as follows:

"The Committee on Scientific Program shall consist of six members of this Association, appointed by the President of this Association; two of which shall be appointed to three-year terms; two of which shall be appointed to two-year terms, and two of which shall be appointed to one-year terms. One member of this Scientific Committee shall be a resident of the city in which the next state meeting will be held. All successors to the original terms shall be appointed by the President for a term of three years each. The committee shall hold its first meeting on or before the second Tuesday in December, at which time it shall consider all suggested speakers for the scientific program, submitted by the members of this Association. The committee shall select at least twenty-five per cent of the speakers on the scientific program from members of the Association, if practicable, and if there are not sufficient suggested local speakers to meet this quota, the committee shall be authorized to request presentation of such papers from individuals who are members. It shall determine the character and scope of the scientific proceedings of the Association, subject to the provision of instructions of the House of Delegates or of the Association, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the Association as nearly as is practicable."

Your Committee on Resolutions wishes to submit the following amendment to the By-Laws:

That Chapter XIII of the By-Laws be amended to read as follows:

"These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session. Any such amendment may be introduced at any session of the House of Delegates but shall be laid upon the table for that current session, but may be acted upon at any later session of the House of Delegates."

On motion duly made, seconded and passed, the order of business was changed for the purpose of accepting an amendment to the Report of the Reference Committee to consider the report of the Committee on Medical Economics. The amendment related to the section where the reference committee recommended that a committee of three be appointed to inspect and approve hospital and medical policies and to consult with the State Insurance Commissioner. The following remarks were made by Dr. Larson: "If this suggestion goes through, I would be faced with the job of appointing these three members. I believe there is great merit in this idea but this committee is going to have a great deal of responsibility. First of all, they will have to decide what is good policy. Are you going to give them authority to place the stamp of approval upon a given policy by a given company?

"You have a Sub-Committee on Prepayment Medical Plans. I would like to suggest that this motion be amended to give the authority to that Committee on Medical Economics. A committee of three is all right and if it is going to be up to me to appoint them, I will do the best I can, but this is a ticklish situation. I can foresee some difficulties and a small committee without the advantage of a lot of the ground work already having been laid by existing committees, may have a job on its hands."

On motion duly made, seconded and passed, the reference committee report to consider the report of the Committee on Medical Economics, was amended to read as follows:

"Inasmuch as many old line companies are selling an acceptable policy for medical and hospital care, they feel aggrieved at the Medical Association's endorsement of the Blue Shield plan only. We, therefore, recommend that companies which sell acceptable policies may also be approved by the Association upon application. We recommend that the Committee on Medical Economics be empowered to examine prepaid medical insurance policies and that this committee be given the power to approve and disapprove such policies, and further that they be empowered to consult with the State Commissioner of Insurance in regard to issuance of licenses to companies selling prepaid medical and hospital insurance. We recommend that the North Dakota State Commissioner of Insurance be requested to avail himself of the services of this committee."

The order of business then reverted to the adoption of the reference committee Report on Resolutions.

Your Committee on Resolutions wishes to present the following resolution:

Whereas, the Sixty-third Annual Meeting of the North Dakota State Medical Association held in Grand Forks, North Dakota, May 27th to 30th, 1950, presents an outstanding scientific and entertainment program,

Now, Therefore, Be It Resolved, that the House of Delegates offer its thanks and appreciation to the Grand Forks District Medical Society, to the city of Grand Forks, to Dr. W. A. Wright, State Association President, and to the several local program and entertainment committees for the efforts and contributions they have made to assure a successful meeting.

Your committee on resolutions wishes to present the following resolutions:

Whereas, the Woman's Auxiliary of the North Dakota State Medical Association, under the able leadership of President Mrs. H. M. Berg of Bismarck, has continued to be of great assistance to our Association, being especially helpful to our organization in its stand against the socialization of medicine,

Now, therefore, be it resolved, that the House of Delegates express its appreciation to the Auxiliary.

Your committee on resolutions wishes to present the following resolution:

Whereas, the American people now enjoy the privileges of the highest level of health, the best standards of scientific medicine and the free choice of medical care,

And whereas, the accomplishments of American medicine were attained by free people, working under a system of free enterprise,

And Whereas, in the experience of all countries where government has assumed control of medical care, there has been a progressive deterioration of medical standards and medical care to the detriment of the health of these people,

Now, Therefore, Be It Resolved, that the House of Delegates, assembled at this sixty-third annual meeting, strongly protest to the Congress of the United States the passage of any legislation imposing upon the people of this nation any form of compulsory health insurance, or any system of medical care designed for national bureaucratic control,

And Be It Further Resolved, that a copy of this resolution be forwarded to the chairman of the Appropriations Committee of the United States Senate and House of Representatives, and to the congressmen from the State of North Dakota.

Your committee on resolutions wishes to present the following resolution:

Whereas, the people of North Dakota and the United States of America enjoy the finest medical care in the world,

And Whereas, this has been accomplished by a free medical profession, developed under the American system of individual endeavor,

And Whereas, there are numerous movements being proposed that would stifle this system,

And Whereas, these movements are obscured by misleading titles,

And Whereas, H. R. Bill 6000 in the Congress of the United States dealing with Social Security may be such a move,

Now, Therefore, Be It Resolved, that the House of Delegates assembled at the sixty-third annual meeting of the North Dakota State Medical Association oppose H. R. Bill 6000 as presently presented and suggest that in the interest of the people of North Dakota and the medical profession serving them, our duly elected representatives in the United States Senate and House of Representatives do investigate the administration of the present Social Security Law, investigate the lobbying of Social Security employees in the interest of their own department, and investigate the costly, cumbersome multiple report system of wage recording, that more efficiency in Social Security administration be obtained at a saving of tax dollars,

Be It Further Resolved, that a copy of this resolution be forwarded to the representatives from North Dakota to the United States Congress.

Your committee on resolutions wishes to present the following resolution:

Whereas, the President of the United States continues to propose a form of compulsory medical insurance, and,

Whereas, the best efforts of the A.M.A. and the state societies are unalterably opposed to this form of legislation, and

Whereas, opposition to this form of bureaucracy can best be proposed by an educational program,

Now, Therefore, Be It Resolved, that the President of the Association continue the present Public Policy and Legislative Committee as previously appointed.

Your committee on resolutions wishes to present the following resolution:

Whereas, the overall problem is not socialized medicine alone, but socialism in all its forms, and

Whereas, the A.M.A. has done a commendable job of education on a national level, and our state committee has been working diligently in disseminating information to the doctors in preparation for the general education of the laity at the local level,

Now, Therefore, Be It Resolved, that the State Medical Association be instrumental in organizing and assisting the county societies in obtaining the cooperation of various local lay groups in opposing the problem of socialism and socialized medicine at the local level, and

Be It Further Resolved, that we, as physicians, be active and enthusiastic in opposing socialism in all its forms.

Your Committee on Resolutions wishes to present the following resolution:

Dr. Philip H. Woutat, president of the North Dakota Radiological Society, presented to the House of Delegates detailed information as to the so-called Hess Committee report of the American Medical Association. The report and recommendations of that society are copied herewith and attention is invited to the fact that consideration has been given in this report to other branches of medicine as well as radiology.

"Whereas, the practice of medicine by lay organizations, both individual and institutional, is becoming of increasing and grave concern, and

Whereas, a resolution adopted by the Board of Trustees of the American Hospital Association in March, 1950, indicates their consideration of absorption of the services of radiology, pathology, anesthesiology, and physical medicine as hospital services, and

Whereas, it is illegal, with some exceptions, and unethical for any lay corporation to practice medicine and to furnish medical services for a professional fee which shall be so divided as to produce a profit for a lay employer, either individual or institutional, and

Whereas, the House of Delegates of the American Medical Association meeting in Atlantic City, New Jersey, in June, 1949, adopted the report of the Committee on Hospitals and the Practice of Medicine (Hess committee) as amended by the reference committee on the report of the Board of Trustees, and

Whereas, the House of Delegates of the American Medical Association meeting in Washington, D.C., December, 1949, re-referred the above report to the Committee on Hospitals and the Practice of Medicine (Hess committee) for rewording, and

Whereas, the report contains recommendations and modes of procedure calculated to eliminate the above and other differences between doctors of medicine and hospitals, and/or medical schools, which are contrary to the public welfare, Now, Therefore, Be It Resolved, that the North Dakota Radiological Society meeting in Fargo in April, 1950, record its support of the principles set forth in the Hess Report, and

Be It Further Resolved, that this action of the North Dakota Radiological Society be transmitted at once to the North Dakota State Medical Association requesting the North Dakota State Medical Association to support the North Dakota Radiological Society in their position as favoring the principles of the Hess report, and that the North Dakota State Medical Association appoint a committee on Hospital and Professional relations, or delegate the functions of such a committee to an appropriate standing committee, and

Be It Further Resolved, that the delegate of the North Dakota State Medical Association to the House of Delegates of the American Medical Association meeting in San Francisco in June, 1950, be advised of this action, and be requested to lend the support which his best judgment indicates necessary to adopt the principles of the Hess report in a form that will be consistent with federal and state law, and will enforce the principles of medical ethics of the American Medical Association.

PHILIP H. WOUTAT, M.D., President,
North Dakota Radiological Society"

Whereas, this report implies the possibility of procedural methods of medical practice contrary to that considered best in the state of North Dakota,

Now, Therefore, Be It Resolved, that this report be accepted and the resolution therein be followed.

Your committee on resolutions wishes to present the following resolution:

Whereas, Dr. N. O. Ramstad, Bismarck, North Dakota, and member of the Sixth District Medical Society, has met with the requirements of Article 4, Section 4, of the Constitution referring to Honorary Membership,

Now, Therefore, Be It Resolved, that Dr. N. O. Ramstad be elected to honorary membership in the State Association and that the Secretary be instructed to notify him of the honor.

R. B. RADL, M.D., Chairman
E. M. HAUGRUD, M.D.
T. E. PEDERSON, M.D.
R. O. SAXVIK, M.D.

The House of Delegates adjourned at 4:30 P.M. to reconvene in 15 minutes.

THIRD SESSION OF THE HOUSE OF DELEGATES OF THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

The Speaker called the House to order at 4:45 P.M., May 28, 1950, in the Dacotah room of the Dacotah hotel, Grand Forks, North Dakota.

A quorum was declared present and sixteen doctors answered the roll call.

On motion duly made, seconded and passed, the reading of the minutes of the second session was dispensed with.

Reference Committee on Resolutions

Dr. R. B. Radl, Chairman, presented the following report, which was adopted section by section and as a whole:

Chapter IX, Section 6, of the By-Laws is amended to read as follows:

"Exceptions to the per capita annual assessment are the following:

1. Resident members and non-resident members who have retired from active practice shall be assessed $10.00 per annum.
2. Resident and non-resident members in active practice outside of the state but who return to the state within two years shall be asssessed $10.00 per annum.
3. Members in graduate training without restrictions to the period of time involved shall be assessed $10.00 per annum.
4. Members who are totally and permanently disabled for medical practice by reason of physical or mental incapacity shall be exempt from any annual assessment. Such member shall not have the right to vote or to hold office and shall not receive the official publication of the Association without charge.

New Business

On motion duly made, seconded and passed, the Executive Secretary was directed to cause the Constitution and By-Laws to be reprinted and sent out to every member of the Association.

Adjournment

The Speaker declared the House of Delegates adjourned sine die at 6:00 P.M.

SCIENTIFIC PROGRAM

Monday, May 29, 1950

High School Auditorium, Grand Forks, North Dakota

8:30 to 9:30 A.M.—Registration.

9:30 to 10:00—"The Use of Anesthesia in General Practice"—Dr. J. S. Lundy, Mayo Clinic, Rochester, Minnesota. (Dr. Lundy was introduced by Dr. W. A. Wright, President of the Association, as the son of a pioneer doctor from Inkster, North Dakota. Dr. O. W. Johnson in behalf of the State Board of Medical Examiners presented Dr. Lundy with a license to practice in North Dakota.)

10:00 to 10:30—Intermission.

10:30 to 11:00—"Cancer of the Large Bowel"—Dr. John T. Reynolds, University of Illinois College of Medicine.

11:00 to 11:30—"Diagnosis and Treatment of Chronic Occlusive Arterial Disease of the Extremities"—Dr. Nelson W. Barker, Mayo Clinic, Rochester, Minnesota.

2:00 to 2:30 P.M.—"Treatment of Some of the Common Medical Emergencies"—Dr. R. B. Radl, Bismarck, North Dakota.

2:30 to 3:00—"Surgical Treatment of Peptic Ulcer"—Dr. Lester R. Dragstedt, chairman, Department of Surgery, University of Chicago, Chicago, Illinois.

3:00 to 3:30—Intermission.

3:30 to 4:00—"The Significance of Tumors of the Neck"—Dr. C. W. Mayo, Mayo Clinic, Rochester, Minnesota.

4:00 to 4:30—"Respiratory Allergy in Children"—Dr. Albert Stoesser, University of Minnesota, Minneapolis, Minnesota.

4:30 to 5:00—"Rh Factor and Transfusions"—Dr. A. K. Johnson, Williston, North Dakota.

Tuesday, May 30, 1950

High School Auditorium, Grand Forks, North Dakota

9:30 to 9:30 A.M.—"Treatment of Fractures Which Require Open Reduction"—Dr. A. E. Culmer, Grand Forks, North Dakota.

9:30 to 10:00—"Cancer of the Lung"—Dr. L. G. Rigler, chief, Department of Radiology, University of Minnesota, Minneapolis, Minnesota.

10:00 to 10:30—Presidential address—Dr. W. A. Wright, President, North Dakota State Medical Association, Williston, North Dakota. — Inaugural address—Dr. L. W. Larson, President-Elect, North Dakota State Medical Association, Bismarck, North Dakota.

10:30 to 11:00—Clinical Pathological Conference in the Exhibit Hall. Dr. J. D. Cardy, Professor of Pathology, University of North Dakota School of Medicine.

11:00 to 12:30—"The Surgeon's Role in the Management of Cancer of the Alimentary Tract"—Dr. Owen H. Wangensteen, chief, Department of Surgery, University of Minnesota, Minneapolis, Minnesota.

2:00 to 2:30—"Application of the Insulins in the Treatment of Diabetes Mellitus with Comments on Diabetes Detection"—Dr. Lester J. Palmer, Clinical Professor of Medicine, Washington State University, Seattle, Washington, and President-elect of the American Diabetes Association.

2:30 to 3:00—"The Use of Antibiotics in General Practice"—Dr. D. R. Nichols, Mayo Clinic, Rochester, Minnesota.

3:00 to 3:30—Intermission.

3:30 to 4:00—"Diagnosis and Treatment of Common Endocrinologic Disorders"—Dr. W. A. Stafne, and Dr. L. E. Wold, Fargo, North Dakota.

4:00 to 4:30—"The Hysterectomy Problem"—Dr. Leonard A. Lang, Minneapolis, Minnesota.

4:30 to 5:00—"Poliomyelitis: Diagnosis and Treatment"—Dr. L. G. Pray, Fargo, North Dakota.

Installation of President

Dr. W. A. Wright: I now have a very pleasant duty and privilege to perform; that is calling on the incoming President to take office. Dr. Robert Campbell and Dr. Paul Burton, will you escort Dr. L. W. Larson of Bismarck to the platform? Dr. Larson should feel very proud to have as his escorts two such distinguished past presidents. It is my very great pleasure and a real satisfaction to know that I can turn this office over to the one man in North Dakota who is the most qualified in medical affairs to offer the best type of leadership the Association is entitled to. I now present to you, your new President, Dr. L. W. Larson, of Bismarck.

INAUGURAL ADDRESS

L. W. Larson, M.D.
Bismarck, North Dakota

Thank you, Drs. Wright, Campbell and Burton. I wish to thank you for the honor you have conferred upon me.

It is my earnest desire to merit your confidence in my ability to discharge the duties and fulfill the obligations incident to the office of President of our Association. It has been blessed with the ability and devotion to duty of a long list of past presidents. Not the least of these is my predecessor, Dr. Willard Wright. He entered the presidency with a thorough knowledge of the social and economic problems which face our profession and he has contributed generously of his time and talents to the affairs of the Association during the past year. I pledge you my determination to do likewise. Your continued support is solicited. United in a common effort we will not fail to uphold the high traditions of service to the people of our state which our Association has maintained for over half a century.

A glorious history of progress and attainment has been written by the medical profession since our Association was founded in 1888. Research laboratories and public health departments have almost eliminated the contagious diseases which plagued our people as recently as twenty-five years ago. The discovery of insulin has reduced diabetes to a low position as the cause of morbidity as well as mortality. Pernicious anemia is no longer a frightful disease since Minot and Murphy discovered liver as a therapeutic agent. The sulfa drugs and the antibiotics have conquered most of the infectious processes, against which the profession was literally hlepless less than two decades ago. Pediatrics and obstetrics have made such notable progress during this period that the hazards of child-bearing and neonatal life have been reduced to unbelievably low figures. Surgery has progressed to the point where total gastrectomy, pneumonectomy and the removal of hitherto inoperable brain tumors are being done almost routinely by qualified surgeons. Increased knowledge of fluid balance and the liberal use of safe blood have saved countless lives from medical and surgical deaths. The discovery of the Rh factor is reducing the mortality from erythroblastosis and blood transfusions. There is even a strong possibility that a successful treatment for cancer will be forthcoming as the result of the combined program of research which is being sponsored by the National Cancer Institute and the American Cancer Society. Our hospitals have developed from the rooming-house stage to institutions in which patients throughout the land can go with safety and physicians can practice scientific medicine. Our medical schools have grown from the diploma-mill era to the modern school of today, capable of turning out graduates with a vast knowledge of disease.

The medical profession can take great pride in these developments which have contributed so greatly in making our country what it is today. But other important factors have developed to influence the lives of our people during this same period. We have fought and won two world wars, the impacts of which will not be erased for generations to come. Pressure groups, both large and small, have become so powerful that our politicians dare not displease them for fear of reprisals. The philosophy of federal government paternalism, which was the outgrowth of the depression during the thirties, has become so entrenched in Washington that the old concepts of initiative, hard work, and personal responsibility have been discarded by a large segment of our population. An inevitable result has been the demand for compulsory health insurance on the part of many either through design or because of honest or misguided motives. Organized medicine has been attacked through the press and radio, on the floor of Congress, and in its committee hearings for its "do-nothing" policy. Charges of monopoly have been hurled by men and women in high places. Attempts have been made to substantiate these claims through court action and investigations by representatives of the justice departments. But through it all our profession has remained firm in its conviction that the practice of medicine in the United States must not be subjected to government control. Through the American Medical Association it has developed a program of education designed to inform the public of the dangers of socialized medicine. The results have been striking. Thousands of organiztions, whose members come from all walks of life, have joined in the fight to preserve American medicine as we know it today. People are beginning to realize that government control of medicine is invariably a first step to socialism and that fascism or communism will come later. The time has come when our people are ready to exercise their greatest heritage, that of the right to vote without fear, against those who would lead us down the road that can end only in the same deplorable condition in which millions of people throughout the world find themselves today.

The responsibility of the individual physician to his profession and to his patients has never been greater than it is today. He must provide good medical care at a price his patients can afford to pay. The public has never been as well-informed on medical matters as at present. Slip-shod examinations and curbstone consultants will not satisfy a people who know that modern medicine is a science as well as an art. But the responsibility of the individual physician does not end there. He is indebted to his fellow citizens for the privilege they grant him to practice his profession without government control. In return, it is his duty to take an active interest in the social, economic, and political problems facing our nation today. If he really believes in free enterprise he should say so. Furthermore, he should openly support those candidates for office who share the same beliefs. The recent primary election in Florida emphasizes what an aroused profession can do to help defeat a candidate for the United States Senate who has been known throughout his Washington career as a vitriolic critic of our profession, and a proponent of every left wing scheme presented to the Congress, including compulsory health insurance. Fortunately, the issues are being made more clear each year throughout the country, and the candidates, regardless of party affiliation, are labeled so that all may know what they stand for and what they will do if elected.

Our profession has accomplished much in the past. Its task in the years ahead is clear. The statement of Sir Frances Drake seems appropriate for us all: "Grant us to know that it is not the beginning, but the continuing of the same until it is thoroughly finished, which yieldeth the true glory."

PRESIDENTIAL ADDRESS

W. A. Wright, M.D.
Williston, North Dakota

It makes me very happy to have Dr. Lancaster say all these nice things about me. I hope I have deserved some of them. This has been a very happy year because I have had, and hope merited, the respect of our Association. I have had the pleasure of associating with so many fine people and have had excellent cooperation from all our members. I want to thank each and everyone of you that has helped so much in the past year. I hope I shall still be an active member of the Association after I give up this office.

I think you will all agree that for some years past, the paramount objective of organized medicine has been to withstand the assaults of those, who wish to transfer control of medical practice from the profession to the federal government. During this time, we have learned that in this battle we do not stand alone. We have with us other men of good will who believe in the dignity and liberty of the individual, rather than in an all-powerful socialistic or welfare state. We are not facing the prospect of socialization of the practice of medicine only, we face complete socialization and domination of our everyday lives. Hence, I am going to speak to you today concerning our obligation to society as a whole and have chosen for my title the phrase "No Man Is An Island."

"No man is an island entire unto himself," wrote John Donne, the 17th century cleric and poet. We are each a small part of mankind deriving from the past and contributing to the future. Similarly, a doctor is not a doctor only, but is a part of the fabric of our community life and our civilization. As one of the present civic responsibilities for which he will not receive any immediate reward, a doctor is called upon to lead the current phase of the never ending struggle for freedom of the individual. For it seems certain that if we are to retain and advance this freedom, it will be necessary for us to exert time and effort without thought of personal gain.

Vast numbers of people throughout the world now live under a system of government which calls for complete subservience to an all-powerful state. As yet, this has not happened here, but the danger is ever present and we must always remember that our individual liberty is not something to be taken for granted. We must remember that freedom is a living thing in a constantly changing social order. It is something to work and fight for, to be retained and, where possible, extended. In many respects, it seems fitting that the medical profession should play a leading role in this social struggle. We are by virtue of natural selection, education, later training and responsibility of our position, persons who should qualify for leadership. Something over one hundred years ago, Robert Louis Stevenson wrote "There are men and classes of men that stand above the common herd, the soldier, the sailor and the shepherd not infrequently, the artist rarely, rarer still the clergyman, the physician almost as a rule. He is the flower, such as it is, of our civilization. He will be thought to have shared as little as any in the defects of the period and most notably exhibited the virtues of the race." Can we, of this day, deserve this high tribute?

With the rise of scientific medicine there has been a great tendency for physicians to be content with furthering professional and scientific ends with consequent neglect of their social and political duties. We have, perhaps, not taken that place in the ordinary affairs of the community, state and nation for which we are fitted. To be sure, complete devotion to science is a full and exacting life and undoubtedly, a completely rewarding one; but science alone does not make the complete man. And many thoughtful observers feel that we should be prepared, not only to work for the increased knowledge and facilities of the profession, but we, also, should remember our duties as citizens. Certainly, no one will deny that this is a time when intelligent and enlightened leadership is needed throughout our nation, as perhaps never before.

Francis Bacon defined our duty to our profession when he wrote, "I hold every man a debtor to his profession from the which as men, of course, do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help, an ornament thereunto." And again Bacon points out our general obligations, when he said, "Men in great place are thrice servants; servants of the sovereign state, servants of fame and servants of their business or profession."

In addition, then, to being members of an honored and respected profession, we have the great privilege of living under the system of American democracy. Certainly it seems that as ordinary, thoughtful citizens, we should be interested in maintaining the democratic system which, so far, has served us so well. Our democratic tradition is deeply rooted in the past, extending, at least, back to that day in June, 1215, when the bold knights of England at Runneymede forced King John to grant them the Magna Charta. Since then, our freedom has been gradually extended over the many years by men who worked, fought and died for liberty. One wonders what some of these bold knights and those who followed them would think of the many Americans who because of indifference or self-interest will not exert themselves to retain and extend the same hard-won freedoms. As Shakespeare expressed it, "the time of life is short, to spend that shortness basely were too long."

We doctors are primarily called upon to so conduct our affairs that people in general will recognize the superiority of private practice over any form of political medicine. Most of our personal and collective activities are subjected to quite close scrutiny; as John Donne remarked, "I observe the physician with the same diligence as he the disease."

Modern methods of collecting and distributing information result in wide and often premature publicity. Much of this may, from our point of view, be undesirable, but it certainly calls for intelligent action on our part. A leading member of the modern profession of public relations counsellor, Benjamin Sonnenberg, describes this situation in a profile by Geoffrey Hellman in *The New Yorker*. He is quoted as saying, "In the olden days, your only forum was a courtroom; at the present time, you are tried in the press or other public media; you are tried before the bar of public opinion, a man's whole career can be ruined, because of the media of mass communication, by innuendo. The law can't catch up with that. 'The result is that as a man or even a corporation is more and more dependent on public opinion, it is necessary to practice preventive medicine in publicity and to initiate counter attacks. It is no longer enough merely for a man to sell his wares at a profit. He must take time out to express a feeling of social responsibility. It is important what he does with the money after he makes his profit, how large that profit is, and whether or not he is, at all times, behaving in the public interest. He can survive only by consent of the consumers, who are not now the sort to listen to William H. Vanderbilt's philosophy of "the public be damned."

You hardly need to be reminded of the great public appetite now existing for information on medical subjects in both the scientific and economic fields. The various media for the dissemination of news are all seeking items of medical interest for presentation. This presents us with one opportunity for public service. We must see that so far as possible, information is factual, ethically presented, interesting and valuable. Certainly, it is to our advantage not to shirk this obligation, because we know so well that our most valuable ally is a properly informed body of public opinion.

But our responsibility extends beyond the mere dissemination of proper scientific and economic information as it pertains to health and related subjects. We have the duty and privilege of furnishing in the common ordinary affairs of the community that leadership and that amount of time and energy which is required in a democratic society, so that such a society may function for the general good. Certainly, the majority of the medical profession are not in sympathy with the type of leadership which is presently being offered us by many of those both in and out of office. Too many of them remind us of the fellow Sam Johnson described as having "but one idea and that was the wrong one." Or as Robert Burton, author of the *Anatomy of Melancholy* observed: "set a beggar on horseback and he will ride at a gallop."

Often we are discouraged by the magnitude and complexity of the problems facing our civilization. It is comforting, then, to read a few lines written by Winston Churchill in a book concerning hobbies, in which he writes of the pleasures of a large library. Certainly, few men in our day have struggled with more vexatious situations than he has. Nor for that matter, has any one man made better progress in the settlement of many of these problems. Churchill wrote, "To browse about a library is to chase pride, even in its most innocent forms, from the heart. As one surveys the mighty array of sages, saints, historians, scientists, poets and philosophers, whose treasures one will never be able to admire, still less enjoy, the brief tenure of our existence here dominates mind and spirit. Think of all the wonderful tales that have been told, well told, which you will never know. Think of all the searching inquiries into matters of great consequence, which you will never pursue. Think of all the delighting or disturbing ideas that you will never share. Think of all the mighty labors that have been accomplished for your service, but of which you will never reap the harvest."

North Dakota State Medical Association Roster-1950

MEMBERSHIP BY DISTRICTS

First District

Haugrud, E. M., Pres.	Fargo
Hawn, H. W., Sec.	Fargo
Armstrong, W. B.	Fargo
Bacheller, S. C.	Enderlin
Baird, J. A.	Fargo
Bakke, H.	Lisbon
Bateman, C. V.	Wahpeton
Beithon, E. J.	Wahpeton
Beltz, Melvin E.	Wahpeton
Borland, V. G.	Fargo
Burt, A. C.	Fargo
Burton, John P.	Fargo
Burton, P. H.	Fargo
Clark, I. D., Jr.	Casselton
Corbus, B. C., Jr.	Fargo
Darner, C. B.	Fargo
Darrow, F. I. (Rtd.)	Fargo
Darrow, K. E.	Fargo
DeCesare, F. A.	Fargo
Dillard, J. R.	Fargo
Dodds, G. A.	Fargo
Donat, T. L.	Fargo
Elofson, C. E.	Fargo
Fjelde, J. H.	Fargo
Fortin, H. J.	Fargo
Fortney, A. C.	Fargo
Foster, G. C.	Fargo
Geib, Marvin	Fargo
Gronvold, F. O.	Fargo
Hall, G. H.	Fargo
Hanna, J. F.	Fargo
Haugrud, E. M.	Fargo
Hawn, H. W.	Fargo
Heilman, C. O.	Fargo
Hunter, C. M.	Fargo
Hunter, G. W.	Fargo
Ivers, G. U.	Fargo
Klakeg, C. H.	Fargo
Klein, A. L.	Fargo
Kulland, Roy	West Fargo
Lancaster, W. E. G.	Fargo
Larson, G. A.	Fargo
LeMar, John	Fargo
Lewis, T. H.	Fargo
Long, W. H.	Fargo
Lytle, F. T.	Fargo
Mazur, B. A.	Fargo
Miller, H. W. (Rtd.)	Casselton
Moe, A. E.	Fargo
Morris, A. C. (Rtd.)	Fargo
Nichols, A. A.	Fargo
Nichols, W. C.	Fargo
Oftedal, Trygve	Fargo
Ostfield, J. R.	Fargo
Peterson, E. R.	Fargo
Poindexter, M. H., Jr.	Fargo
Pray, L. G.	Fargo
Richter, E. H.	Hunter
Rogers, R. G.	Fargo
Schleinitz, F. B.	Hankinson
Schneider, J. F.	Fargo
Sedlak, O. A.	Fargo
Stafne, W. A.	Fargo
Swanson, J. C.	Fargo
Tainter, Rolfe	Fargo
Thompson, A. M.	Wahpeton

First—(Continued)

Tronnes, Nels (Rtd.)	Fargo
Urenn, B. M.	Fargo
Veitch, Abner	Lisbon
Weible, R. D.	Fargo
Wold, L. E.	Fargo
Wright, Wm. K.	Fargo

Devils Lake

Fawcett, R. M., Pres.	Devils Lake
Fawcett, D. W., Sec.	Devils Lake
Engesather, J. A. D.	Brocket
Fawcett, D. W.	Devils Lake
Fawcett, J. C.	Devils Lake
Fawcett, R. M.	Devils Lake
Fox, W. R.	Rugby
Gerber, L. S. (N. Mex.)	Albuquerque
Horsman, A. T. (Hon.)	Devils Lake
Johnson, C. G.	Rugby
Keller, E. T.	Rugby
MacDonald, J. A.	Cando
Mahoney, J. H.	Devils Lake
Miles, A. M.	Rolla
Palmer, D. W.	Cando
Pine, L. F.	Devils Lake
Pollard, W. S.	Minnewaukan
Sihler, W. F. (Hon.)	Devils Lake
Stickelberger, J. S. (Rtd.)	Oberon
Toomey, G. W.	Devils Lake
Vigeland, G. N.	Maddock

Grand Forks

Mahowald, R. E., Pres.	Grand Forks
Graham, J. H., Sec.	Grand Forks
Alger, L. J.	Grand Forks
Benson, T. Q.	Grand Forks
Benwell, H. D.	Grand Forks
Brown, B. E. (Rtd.) (Ia.)	Iowa City
Brown, G. F. (Ia.)	Iowa City
Burrows, F. N. (Hon.)	Bathgate
Campbell, R. D. (Hon.)	Grand Forks
Countryman, G. L.	Grafton
Countryman, J. E. (Hon.) (Ore.)	Arch Cape
Culmer, A. E., Jr.	Grand Forks
Dailey, W. C.	Grand Forks
Deason, F. W.	Grafton
Flaten, A. N.	Edinburg
Fritzell, K. E.	Grand Forks
Glaspel, C. J.	Grafton
Graham, C. M.	Grand Forks
Graham, J. H.	Grand Forks
Grinnell, E. L.	Grand Forks
Haugen, C. O.	Larimore
Haunz, E. A.	Grand Forks
Hill, Frank A.	Grand Forks
Jensen, A. F.	Grand Forks
Johann, O. P.	Grafton
Lamont, J. G.	Grafton
Landry, L. H.	Walhalla
Leigh, R. E.	Grand Forks
Leigh, Richard	Grand Forks
Liebeler, W. A.	Grand Forks
Lommen, C. E.	Fordville

Grand Forks—(Continued)

Mahowald, R. E.	Grand Forks
Moore, J. H.	Grand Forks
Muus, J. Meyer	McVille
Muus, O. H.	Grand Forks
Panek, A. F.	Milton
Peake, F. Margaret	Grand Forks
Piltingsrud, H. R.	Park River
Porter, C. B.	Grand Forks
Quale, V. S.	Grand Forks
Rand, C. C.	Grafton
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Sandmeyer, J. A.	Grand Forks
Silverman, L. B.	Grand Forks
Stratte, J. J.	Grand Forks
Strom, A. D.	Langdon
Thorgrimson, G. G.	Grand Forks
Tompkins, C. R.	Grafton
Tompkins, Wm.	Grafton
Turner, R. C.	Grand Forks
Vance, R. W.	Grand Forks
Waldren, G. R.	Cavalier
Waldren, H. M., Jr.	Drayton
Weed, F. E.	Park River
Williamson, G. M. (Hon.)	Grand Forks
Witherstine, W. H.	Grand Forks
Woutat, P. H.	Grand Forks
Youngs, N. A.	Grand Forks

Kotana

Craven, J. P., Pres.	Williston
Skjei, D. E., Sec.	Williston
AbPlanalp, I. S.	Williston
Craven, J. D.	Williston
Craven, J. P.	Williston
Hagan, E. J.	Williston
Johnson, A. K.	Williston
Johnson, P. O. C.	Watford City
Korwin, J. J.	Williston
Lund, C. M.	Williston
McPhail, C. O.	Crosby
Skjei, D. E.	Williston
Wright, W. A.	Williston

Northwest

Fischer, V. J., Pres.	Minot
Hurly, W. C., Sec.	Minot
Ayash, J. J.	Minot
Ball, Wm. J.	Minot
Beck, Charles	Harvey
Bethea, R. O., Jr.	Minot
Blatherwick, Robt.	Parshall
Blatherwick, W. E.	Sanish
Bray, D. L.	Algona, Ia.
Breslich, P. J.	Minot
Cameron, A. L.	Minot
Combs, A. B.	Minot
Conroy, M. P.	Minot
Craise, O. S.	Towner
Devine, J. L., Jr.	Minot
Devine, J. L., Sr.	Minot
Dyson, R. E.	Minot
Ensign, Wm. G.	Minot

Northwest—(Continued)

Erenfeld, F. R.	Minot
Fischer, V. J.	Minot
Flath, M. G.	Stanley
Gammell, R. T.	Kenmare
Garrison, M. W.	Minot
Greene, E. E.	Westhope
Halliday, D. J.	Kenmare
Halverson, C. H.	Minot
Halverson, H. L.	Minot
Hammargren, A. F.	Harvey
Hochhauser, Martin	Garrison
Huntley, W. B.	Minot
Hurly, Wm. C.	Minot
Ingalls, C. L.	Minot
Johnson, H. Paul	(Ore.) Albany
Johnson, O. W.	Rugby
Kermott, L. H.	Minot
Kermott, L. Henry	Minot
Knudson, K. O.	Glenburn
Lampert, M. T.	Minot
Livingston, N. B., Jr.	Mohall
McCannel, A. D.	Minot
Malvey, Kenneth	Bottineau
Naegeli, F. D.	Minot
Nelson, L. F.	Bottineau
Oltman, D. L.	Minot
Ransom, E. M.	Minot
Rowe, P. H.	Minot
Seiffert, G. S.	Minot
Sorenson, A. R.	Minot
Sorenson, Rodger	Minot
Spomer, J. P.	Minot
Timm, J. F. (Hon.)	(Ore.) Portland
Wall, W. W.	Minot
Wheelon, F. E.	Minot

Sheyenne Valley

Cook, Paul, Pres.	Valley City
Meredith, C. J., Sec.	Valley City
Almklov, L.	Cooperstown
Christianson, Gunder	Valley City
Cook, Paul T.	Valley City
Gilsdorf, W. H.	Valley City
Macdonald, A. C.	Valley City
Macdonald, A. W. (Hon.)	Valley City
Macdonald, Neil A.	Valley City
Meredith, C. J.	Valley City
Merrett, J. P.	Valley City
Van Houten, J. (Rtd.)	Valley City
Wicks, F. L.	Valley City

Sixth

Arneson, C. A., Pres.	Bismarck
Peters, C. H., Sec.	Bismarck
Arneson, C. A.	Bismarck
Bahamonde, J. M.	Elgin
Baumgartner, C. J.	Bismarck
Benson, O. T.	(Cal.) N. Hollywood
Berg, H. M.	Bismarck
Bertheau, H. J.	Linton
Bixby, Harriet	(Mass.) Holliston
Blumenthal, Philip	Mandan
Bodenstab, W. H. (Hon.)	Bismarck
Boerth, E. H.	Bismarck
Breslin, R. H.	Mandan

Sixth—(Continued)

Brink, N. O.	Bismarck
Buckingham, T. W.	Bismarck
Cartwright, John T.	Bismarck
Cochran, R. B.	Bismarck
Constans, G. M. (Rtd.)	Bismarck
Craychee, W. A.	(Minn.) Minneapolis
Dahlen, G. A.	Bismarck
DeMoully, O. M.	Flasher
Diven, W. L.	Bismarck
Enders, W. R.	Hazen
Fredricks, L. H.	Bismarck
Freise, P. W.	Bismarck
Gaebe, O. C.	New Salem
Goughnour, Myron	Bismarck
Griebenow, F. (Rtd.)	Bismarck
Grorud, A. C.	Bismarck
Heffron, M. M.	Bismarck
Heinzeroth, George	Turtle Lake
Henderson, R. W.	Bismarck
Hetzler, A. E.	Mandan
Icenogle, G. D.	Bismarck
Jacobson, M. S.	Elgin
LaRose, V. J. (Rtd.)	Bismarck
Larson, L. W.	Bismarck
Lipp, G. R.	Bismarck
McEwen, John C.	Bismarck
Monteith, George	Hazelton
Nuessle, R. F.	Bismarck
Orr, A. C.	Bismarck
Owens, P. L.	Bismarck
Perrin, E. D.	Bismarck
Peters, Clifford H.	Bismarck
Pierce, W. B.	Bismarck
Quain, E. P. (Hon.)	(Ore.) Salem
Radl, R. B.	Bismarck
Ramstad, N. O. (Hon.)	Bismarck
Roan, M. W. (Rtd.)	Bismarck
Rosenberger, H. P.	(So. Dak.) Aberdeen
Salomone, E.	Elgin
Saxvik, R. O.	Bismarck
Schoregge, C. W.	Bismarck
Schoregge, R. D.	Bismarck
Shannon, D. D.	Riverdale
Shook, L. D.	Riverdale
Smith, C. C.	Mandan
Spielman, George	Mandan
Thompson, Arnold	Bismarck
Tudor, Robert B.	Bismarck
Vinje, E. G.	Hazen
Vinje, Ralph	(Minn.) Minneapolis
Vonnegut, F. F.	Linton
Waldschmidt, R. H.	Bismarck
Weyrens, P. J.	Hebron
Williams, J. R.	Bismarck

Southwestern

Rodgers, R. W., Pres.	Dickinson
Reichert, H. L., Sec.	Dickinson
Bush, C. A.	Beach
Dukart, C. R.	Dickinson
Dukart, Ralph	Dickinson
Gilsdorf, A. R.	Dickinson
Guloien, H. E.	Dickinson
Gumper, A. J.	Dickinson
Helseth, H. K.	Mott
Larsen, H. C.	Dickinson
McNeil, J. H.	Hettinger

Southwest—(Continued)

Martens, Apollon	Killdeer
Reichert, D. J.	Dickinson
Reichert, H. L.	Dickinson
Rodgers, R. W.	Dickinson
Schumacher, Wm. A.	Hettinger
Seitz, Sherwood B.	Richardton
Spanjers, A. J.	Dickinson
Spear, A. E.	Dickinson

Stutsman

Jansonius, J. W., Pres.	Jamestown
Nierling, R. D., Sec.	Jamestown
Arzt, P. G.	Jamestown
Beall, J. A.	Jamestown
Carpenter, G. S.	Jamestown
Culbert, M. H. (Rtd.)	Medina
Cuthbert, W. H.	Jamestown
Elsworth, J. N.	Jamestown
Fergusson, F. W.	Lodi, Calif.
Fergusson, V. D.	Edgeley
Fisher, A. M.	Jamestown
FitzJerrell, H. B.	Jamestown
Gerrish, W. A. (Hon.)	Jamestown
Hieb, E. O.	Jamestown
Holt, G. H.	Jamestown
Jansonius, J. W.	Jamestown
Larson, E. J.	Jamestown
Lucy, R. E.	Jamestown
Lynde, Roy	Ellendale
McFadden, R. L.	Jamestown
Maloney, B. W.	LaMoure
Martin, C. S.	Kensal
Melzer, S. W.	Woodworth
Miles, J. V.	Jamestown
Nierling, R. D.	Jamestown
Pederson, T. D.	Jamestown
Sorkness, Joseph	Jamestown
Wood, W. W.	Jamestown
Woodward, F. O.	Jamestown
Woodward, R. S.	Jamestown

Traill-Steele

Little, R. C., Pres.	Mayville
Vinje, Syver, Sec.	Hillsboro
Andrews, Bernice	Sharon
Cable, Thomas M.	Hillsboro
Cleary, H. G.	Northwood
Dekker, O. D.	Hope
Hoehn, David	Sharon
Kjelland, A. A.	Hatton
Knutson, O. A.	Buxton
LaFleur, H. A.	Mayville
Little, R. C.	Mayville
Savre, M. T.	Northwood
Vinje, Syver	Hillsboro
Wheeler, G. S.	Portland

Tri-County

Boyum, L. E., Pres.	Harvey
Boyum, L. E.	Harvey
Boyum, P. A.	Harvey
Gilliland, R. F.	Carrington
Owens, C. G.	New Rockford
Schwinghamer, E. J.	New Rockford
Seibel, G. W.	New Rockford
Voglewede, Wm. C.	Carrington

1950 Membership, North Dakota State Medical Association

AbPlanalp, I. S.	Williston
Alger, L. J.	Grand Forks
Almklov, L.	Cooperstown
Andrews, Bernice	Sharon
Armstrong, W. B.	Fargo
Arneson, C. A.	Bismarck
Arzt, P. G.	Jamestown
Ayash, J. J.	Minot
Bacheller, S. C.	Enderlin
Bahamonde, J. M.	Elgin
Baird, J. A.	Fargo
Bakke, H.	Lisbon
Ball, Wm. J.	Minot
Bateman, C. V.	Wahpeton
Baumgartner, C. J.	Bismarck
Beall, J. A.	Jamestown
Beck, C. A.	Harvey
Beithon, E. J.	Wahpeton
Beltz, M. E.	Wahpeton
Benson, O. T.	(Cal.) N. Hollywood
Benson, T. Q.	Grand Forks
Benwell, H. D.	Grand Forks
Berg, H. M.	Bismarck
Bertheau, H. J.	Linton
Bethea, R. O., Jr.	Minot
Bixby, Harriet	(Mass.) Holliston
Blatherwick, Robert	Parshall
Blatherwick, Wilfred E.	Sanish
Blumenthal, Philip	Mandan
Bodenstab, W. H. (Hon.)	Bismarck
Boerth, E. H.	Bismarck
Borland, V. G.	Fargo
Boyum, L. E.	Harvey
Boyum, P. A.	Harvey
Bray, D. L.	Algona, Ia.
Breslich, P. J.	Minot
Breslin, R. H.	Mandan
Brink, N. O.	Bismarck
Brown, Bernice E. (Ret.)	(Ia.) Iowa City
Brown, G. F.	(Ia.) Iowa City
Buckingham, T. W.	Bismarck
Burrows, F. N. (Hon.)	Bathgate
Burt, A. C.	Fargo
Burton, John P.	Fargo
Burton, Paul H.	Fargo
Bush, C. A.	Beach
Cable, T. M.	Hillsboro
Cameron, A. L.	Minot
Campbell, R. D. (Hon.)	Grand Forks
Carpenter, G. S.	Jamestown
Cartwright, J. T.	Bismarck
Christianson, Gunder	Valley City
Clark, I. D., Jr.	Casselton
Cleary, H. G.	Northwood
Cochran, R. B.	Bismarck
Combs, A. B.	Minot
Conroy, M. P.	Minot
Constans, G. M. (Rtd.)	Bismarck
Cook, P. T.	Valley City
Corbus, B. C., Jr.	Fargo
Countryman, G. L.	Grafton
Countryman, J. E. (Hon.)	(Ore.) Arch Cape
Craise, O. S.	Towner
Craven, J. D.	Williston
Craven, J. P.	Williston
Craychee, W. A.	(Minn.) Minneapolis
Culbert, M. H. (Rtd.)	Medina
Culmer, A. E., Jr.	Grand Forks
Cuthbert, Wm. H.	Jamestown
Dahlen, G. A.	Bismarck
Dailey, W. C.	Grand Forks
Darner, C. B.	Fargo
Darrow, F. I. (Rtd.)	Fargo
Darrow, K. E.	Fargo
Deason, F. W.	Grafton
DeCesare, F. A.	Fargo
Dekker, O. D.	Hope
DeMoully, O. M.	Flasher
Devine, J. L., Jr.	Minot
Devine, J. L., Sr.	Minot
Dillard, J. R.	Fargo
Diven, W. L.	Bismarck
Dodds, G. A.	Fargo
Donat, T. L.	Fargo
Dukart, C. R.	Dickinson
Dukart, Ralph	Dickinson
Dyson, R. E.	Minot
Elofson, C. E.	Fargo
Elsworth, J. N.	Jamestown
Enders, W. R.	Hazen
Engesather, J. A. D.	Brocket
Ensign, Wm. G.	Minot
Erenfeld, F. R.	Minot
Fawcett, D. W.	Devils Lake
Fawcett, J. C.	Devils Lake
Fawcett, R. M.	Devils Lake
Fergusson, F. W.	Lodi, Calif.
Fergusson, V. D.	Edgeley
Fischer, V. J.	Minot
Fisher, A. M.	Jamestown
FitzJerrell, H. B.	Jamestown
Fjelde, J. H.	Fargo
Flaten, A. N.	Edinburgh
Flath, M. G.	Stanley
Fortin, H. J.	Fargo
Fortney, A. C.	Fargo
Foster, G. C.	Fargo
Fox, W. R.	Rugby
Fredricks, L. H.	Bismarck
Freise, P. W.	Bismarck
Fritzell, K. E.	Grand Forks
Gaebe, O. C.	New Salem
Gammell, R. T.	Kenmare
Garrison, M. W.	Minot
Geib, Marvin J.	Fargo
Gerber, L. S.	(N.M.) Albuquerque
Gerrish, W. A. (Hon.)	Jamestown
Gilliland, R. F.	Carrington
Gilsdorf, A. R.	Dickinson
Gilsdorf, W. H.	Valley City
Glaspel, C. J.	Grafton
Goughnour, Myron	Bismarck
Graham, C. M.	Grand Forks
Graham, J. H.	Grand Forks
Greene, E. E.	Westhope
Griebenow, F. (Rtd.)	Bismarck
Grinnell, E. L.	Grand Forks
Gronvold, F. O.	Fargo
Grorud, A. C.	Bismarck
Guloien, H. E.	Dickinson
Gumper, A. J.	Dickinson
Hagan, E. J.	Williston
Hall, G. H.	Fargo
Halliday, D. J.	Kenmare
Halverson, C. H.	Minot
Halverson, H. L.	Minot
Hammargren, A. F.	Harvey
Hanna, J. F.	Fargo
Haugen, C. O.	Larimore
Haugrud, E. M.	Fargo
Haunz, E. A.	Grand Forks
Hawn, H. W.	Fargo
Heffron, M. M.	Bismarck
Heilman, C. O.	Fargo
Heinzeroth, G. E.	Turtle Lake
Helseth, H. K.	Mott
Henderson, R. W.	Bismarck
Hetzler, A. E.	Mandan
Hieb, E. O.	Jamestown
Hill, Frank A.	Grand Forks
Hochhauser, Martin	Garrison
Hoehn, David	Sharon
Holt, G. H.	Jamestown
Horsman, A. T. (Hon.)	Devils Lake
Hunter, C. M.	Fargo
Hunter, G. W.	Fargo
Huntley, W. B.	Minot
Hulry, Wm. C.	Minot
Icenogle, G. D.	Bismarck
Ingalls, C. L.	Minot
Ivers, G. U.	Fargo
Jacobson, M. S.	Elgin
Jansonius, J. W.	Jamestown
Jensen, A. F.	Grand Forks
Johann, O. P.	Grafton
Johnson, A. K.	Williston
Johnson, C. G.	Rugby
Johnson, H. Paul	(Ore.) Albany
Johnson, O. W.	Rugby
Johnson, P. O. C.	Watford City
Keller, E. T.	Rugby
Kermott, L. Henry	Minot
Kermott, L. H.	Minot
Kjelland, A. A.	Hatton
Klakeg, C. H.	Fargo
Klein, A. L.	Fargo
Knudson, K. O.	Glenburn
Knutson, O. A.	Buxton
Korwin, J. J.	Williston
Kulland, Roy	West Fargo
LaFleur, H. A.	Mayville
Lamont, J. G.	Grafton
Lampert, M. T.	Minot
Lancaster, W. E. G.	Fargo
Landry, L. H.	Walhalla
LaRose, V. J. (Rtd.)	Bismarck
Larsen, H. C.	Dickinson
Larson, E. J.	Jamestown
Larson, G. A.	Fargo
Larson, L. W.	Bismarck
Leigh, Ralph E.	Grand Forks
Leigh, Richard	Grand Forks
LeMar, John	Fargo
Lewis, T. H.	Fargo
Liebeler, W. A.	Grand Forks
Lipp, G. R.	Bismarck
Little, R. C.	Mayville
Livingston, N. B., Jr.	Mohall
Lommen, C. E.	Fordville
Long, W. H.	Fargo
Lucy, R. E.	Jamestown
Lund, C. M.	Williston
Lytle, F. T.	Fargo
Lynde, Roy	Ellendale
McCannel, A. D.	Minot
McEwen, J. C.	Bismarck
McFadden, R. L.	Jamestown
McNeil, J. H.	Hettinger
McPhail, C. O.	Crosby
Macdonald, A. C.	Valley City
Macdonald, A. W. (Hon.)	Valley City
MacDonald, J. A.	Cando
Macdonald, Neil A.	Valley City
Mahoney, J. H.	Devils Lake

Mahowald, R. E.	Grand Forks
Maloney, B. W.	LaMoure
Malvey, Kenneth	Bottineau
Martens, Apollon	Killdeer
Martin, C. S.	Kensal
Mazur, B. A.	Fargo
Melzer, S. W.	Woodworth
Meredith, C. J.	Valley City
Merrett, J. P.	Valley City
Miles, A. M.	Rolla
Miles, J. V.	Jamestown
Miller, H. W. (Rt.)	Casselton
Moe, A. E.	Fargo
Monteith, George	Hazelton
Moore, J. H.	Grand Forks
Morris, A. C. (Rtd.)	Fargo
Muus, J. Meyer	McVille
Muus, O. H.	Grand Forks
Naegeli, F. D.	Minot
Nelson, L. F.	Bottineau
Nichols, A. A.	Fargo
Nichols, Wm. C.	Fargo
Nierling, R. D.	Jamestown
Nuessle, R. F.	Bismarck
Oftedal, Trygve	Fargo
Oltman, D. L.	Minot
Orr, A. C.	Bismarck
Ostfield, J. R.	Fargo
Owens, C. G.	New Rockford
Owens, P. L.	Bismarck
Palmer, D. W.	Cando
Panek, A. F.	Milton
Peake, F. Margaret	Grand Forks
Pederson, T. D.	Jamestown
Perrin, E. D.	Bismarck
Peters, Clifford H.	Bismarck
Peterson, E. R.	Fargo
Pierce, W. B.	Bismarck
Piltingsrud, H. R.	Park River
Pine, L. F.	Devils Lake
Poindexter, M H.	Fargo
Pollard, W. S.	Devils Lake
Porter, C. B.	Grand Forks
Pray, L. G.	Fargo
Quain, E. P. (Hon.)	(Ore.) Salem
Quale, V. S.	Grand Forks
Radl, R. B.	Bismarck
Ramstad, N. O. (Hon.)	Bismarck
Rand, C. C.	Grafton
Ransom, E. M.	Minot
Reichert, D. J.	Dickinson
Reichert, H. L.	Dickinson
Richter, E. H.	Hunter
Roan, M. W. (Rtd.)	Bismarck
Rodgers, R. W.	Dickinson
Rogers, R. G.	Fargo
Rosenberger, H. P.	(So. Dak.) Aberdeen
Rowe, P. H.	Minot
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Salomone, E. J.	Elgin
Sandmeyer, J. A.	Grand Forks
Savre, M. T.	Northwood
Saxvik, R. O.	Bismarck
Schleinitz, F. B.	Hankinson
Schneider, J. F.	Fargo
Schoregge, C. W.	Bismarck
Schoregge, R. D.	Bismarck
Schumacher, Wm. A.	Hettinger
Schwinghamer, E. J.	New Rockford
Sedlak, O. A.	Fargo
Seibel, G. W.	New Rockford
Seiffert, G. S.	Minot
Seitz, Sherwood B.	Richardton
Shannon, D. D.	Riverdale
Shook, L. D.	Riverdale
Sihler, W. F. (Hon.)	Devils Lake
Silverman, L. B.	Grand Forks
Skjei, D. E.	Williston
Smith, C. C.	Mandan
Sorenson, A. R.	Minot
Sorenson, Rodger	Minot
Sorkness, Joseph	Jamestown
Spanjers, A. J.	Dickinson
Spear, A. E.	Dickinson
Spielman, G. H.	Mandan
Spomer, J. P.	Minot
Stafne, Wm. A.	Fargo
Stickelberger, Josephine (Rt.)	Oberon
Stratte, J. J.	Grand Forks
Strom, A. D.	Langdon
Swanson, J. C.	Fargo
Tainter, Rolfe	Fargo
Thompson, Andrew M.	Wahpeton
Thompson, Arnold M.	Bismarck
Thorgrimsen, G. G.	Grand Forks
Timm, John F. (Hon.)	Portland, Ore.
Tompkins, C. R.	Grafton
Tompkins, Wm. A.	Grafton
Toomey, G. W.	Devils Lake
Tronnes, Nels (Rtd.)	Fargo
Tudor, Robert B.	Bismarck
Turner, R. C.	Grand Forks
Urenn, B. M.	Fargo
Van Houten, J.	Valley City
Vance, R. W.	Grand Forks
Veitch, Abner	Lisbon
Vigeland, G. N.	Maddock
Vinje, E. G.	Hazen
Vinje, Ralph (Minn.)	Minneapolis
Vinje, Syver,	Hillsboro
Voglewede, Wm. C.	Carrington
Vonnegut, F. F.	Linton
Waldren, G. R.	Cavalier
Waldren, H. M., Jr.	Drayton
Waldschmidt, R. H.	Bismarck
Wall, W. W.	Minot
Weed, F. E.	Park River
Weible, R. D.	Fargo
Weyrens, P. J.	Hebron
Wheeler, G. S.	Portland
Wheelon, F. E.	Minot
Wicks, F. L.	Valley City
Williams, J. R.	Bismarck
Williamson, G. M. (Hon.)	Grand Forks
Witherstine, W. H.	Grand Forks
Wold, L. E.	Fargo
Wood, W. W.	Jamestown
Woodward, F. O.	Jamestown
Woodward, R. S.	Jamestown
Woutat, P. H.	Grand Forks
Wright, W. A.	Williston
Wright, Wm. K.	Fargo
Youngs, N. A.	Grand Forks

FOURTH ANNUAL MEETING

WOMAN'S AUXILIARY TO THE NORTH DAKOTA STATE MEDICAL ASSOCIATION

Grand Forks, North Dakota, May 28, 29, 30, 1950

The Fourth Annual meeting of the Woman's Auxiliary to the North Dakota State Medical Association, held in Grand Forks, North Dakota, was formally opened by Mrs. H M. Berg, State President, at 10:00 A.M., May 29, 1950. The place of meeting was the Dacotah room, Dacotah hotel.

Mrs. E. T. Keller, Rugby, North Dakota, gave the pledge, which was repeated in unison by the members present.

The address of welcome was given by Mrs. W. A. Liebeler of Grand Forks, who extended a cordial invitation to the members to attend all the functions and stated, in behalf of the members of the Grand Forks district, that they were happy to have the convention in Grand Forks. Mrs. Kermott, Minot, gave the response, and stated that everyone was looking forward to a very helpful and entertaining convention at Grand Forks.

Mrs. David B. Allman, president, Woman's Auxiliary to the American Medical Association, was introduced by Mrs. H. M. Berg, Bismarck, North Dakota. Mrs. Allman expressed her appreciation for the opportunity to be able to attend the convention at Grand Forks.

Minutes of the Executive Board meeting held in Bismarck, October 7, 1949, were read and approved.

The roll was then called and the following were present: Mrs. H. M. Berg, president; Mrs. E. T. Keller, president-elect; Mrs. G. G. Thorgrimson, first vice-president; Mrs. R. W. Rodgers, treasurer; Mrs. J. W. Jansonius, secretary. Others present were: Mrs. E. A. Haunz, Grand Forks; Mrs. A. E. Culmer, Grand Forks; Mrs. G. G. Thorgrimson, Grand Forks; Mrs. W. A. Liebeler, Grand Forks; Mrs. L. W. Larson, Bismarck; Mrs. W. A. Wright, Williston; Mrs. A. K. Johnson, Williston; Mrs. C. J. Meredith, Valley City; Mrs. F. E. Weed, Park River; Mrs. E. Salomone, Elgin; Mrs. H. M. Berg, Bismarck; Mrs. Charles Heilman, Fargo; Mrs. B. C. Corbus, Fargo; Mrs. C. R. Dukart, Dickinson; Mrs. A. P. Nachtwey, Dickinson; Mrs. N. B. Livingston, Jr., Mohall; Mrs. L. Henry Kermott, Minot; Mrs. T. Q. Benson, Grand Forks; Mrs. D. J. Halliday, Kenmare; Mrs. T. W. Buckingham, Bismarck; Mrs. R. D. Nierling, Jamestown.

Mrs. Berg, president, then gave her report to the convention. A copy of this report will be sent to each auxiliary.

President's Report

The third year of the Woman's Auxiliary to the North Dakota State Medical Association has been completed. Our state is fully organized, all districts coming in as charter members. At the present time we have 217 members.

I was disappointed not to have had the privilege of attending the national convention in Atlantic City last June. Due to having been abroad for three months prior to convention time, family cares prevented my going away again within the week. However, I was able to attend the November board meeting of presidents and presidents-elect, in Chicago, and found it to be an inspiration and a challenge. I came away from that meeting with the greatest respect and admiration both for the work and for the fine esprit de corps of the women.

The past winter, the worst in 75 years in this state, interfered greatly with the meetings of the district auxiliaries. It also prevented my attending each auxiliary meeting once during the year. I did, however, visit the Sixth district, the Fourth district, Seventh district, First district, and the Ninth district. The greatest pleasure and the most treasured memories of the past year have been meeting and becoming better acquainted with so many of you fine doctors' wives throughout the state.

The Woman's Auxiliary to the North Dakota State Medical Association's most important function has been and will continue to be to sponsor the activities recommended by the Woman's Auxiliary to the American Medical Association.

Our special project this year has been to have each auxiliary in our state emphasize "Every Member an Informed Member" on all phases of compulsory health insurance. The majority of our districts have purchased and donated copies of the Brookings Institute "Issue of Compulsory Health Insurance" to high school and public libraries in their communities. We have also distributed pamphlets and reprints of the various articles in the Saturday Evening Post, Readers Digest, Look, etc., to the public libraries, state libraries, and interested individuals.

At different times throughout this year we have also sent letters and telegrams to our congressmen protesting legislation that would favor compulsory health insurance.

Dr. and Mrs. Willard Wright of Williston have compiled a very complete talk on socialized medicine which has been given to various groups throughout the state. We estimate at least 1000 people have heard it. We are now working to interest lay people in making our cause theirs. We have made some progress in getting outstanding speakers for PTA groups, church organizations, clubs, etc., promised for next year's programs.

Many of our auxiliaries put on a Nurse Recruitment program in their localities. These programs included the showing of a vocational film on nursing, teas, and a question period conducted by a graduate nurse in uniform.

Several of our district auxiliaries assisted with the work of the mobile x-ray TB survey unit while it was in their community.

Many of the district auxiliaries have assisted in fund-raising campaigns for the Red Cross, Cancer, North Dakota Anti-TB society, and the Crippled Children's hospital.

I wish to express my most sincere appreciation to the state officers and the chairmen of all committees for your cooperation, kindness and friendship during the past year.

I also wish to extend my thanks to the women of Grand Forks for all the love and labor that has gone into the planning of our convention, to insure a very successful meeting.

My thanks, and the thanks of the Woman's Auxiliary to the North Dakota State Medical Association, to Mr. Forsyth Engebretson and Miss Rhea McDonald for their most willing cooperation in any and all of our projects, and particularly for the work done on our News Letter. May I suggest that we all show their office how much we appreciate them by sending in our news!

Gratifying as this year has been, I have high hopes for a bigger and better one, with more enthusiasm and more progress next year, under Mrs. E. T. Keller's leadership.

Mrs. H. M. Berg, President

Organization Chairman's Report

As organization chairman, may I submit the following report: This past year we have had an increase of 36 new members, making a total of 219 paid memberships.

Richland district has joined with the First district. Southern district and Stutsman have combined. Traill-Steele has joined with the Grand Forks district, although it has kept its separate group of officers. There is a possibility that Tri-County district will join the Devils Lake district.

Previously, the new councillor's names have been presented by the nominating committee and elected at the state convention. This year, since we are organized and have met all of the women in each district, it was decided that those districts who are eligible for new councillors should elect their councillors at the same time as election of officers. By doing this it would encourage the new councillors to attend the state convention and would eliminate any foreseeable possibility of a newly nominated councillor to be unable to accept her office.

Mrs. E. T. Keller, Chairman

Mrs. R. W. Rodgers, treasurer, stated that the Traill-Steele dues had not been received at convention time.

Legislation Report

This being an "off year" for our state legislature, our work was limited to getting information before the public on the subject of the evils of socialized medicine.

We distributed material received from the national office and encouraged lay groups to read prepared papers on the subject. The paper prepared by Dr. and Mrs. Wright was given by layman before groups throughout the state.

The auxiliary helped defeat President Truman's Reorganization Plan No. 1, which would have put federal health functions under the control of a department of welfare, elevating Oscar Ewing, director of the Federal Security agency to the cabinet post of secretary of welfare.

The auxiliary has also helped in opposition to HR 6000 which greatly expanded the Social Security program, including the adoption of provisions for sickness and disability insurance for all covered by the Social Security Act.

Our work of "holding the line" distributing the information given us and quietly but firmly trying to prevent the turn toward socialism of any kind, has only begun. We know from what we have done the past two years that it is a very big job but a most necessary one. We must be prepared to do whatever we can wherever we can in the years to come.

Our state legislature will meet this next year. Our members must be ready to act at short notice. From the past we have learned that bills dangerous to ourselves and our communities will be introduced suddenly and without warning.

Mrs. W. B. Pierce, Chairman

Public Relations Report

There are 11 Auxiliary districts in North Dakota. Our membership in July, 1949, was 217.

The activities of the North Dakota Medical Auxiliary for the past year have been devoted mainly to a project endorsed by and under the supervision of the North Dakota State Medical Society—the giving of talks and programs on socialized medicine by the various women's clubs and organizations throughout the state.

Response to the proposed project has been variable. Two districts are purely social groups. In other districts results of the project have been very gratifying.

We feel that many of the people in various communities have been correctly informed of the facts of socialized medicine and at the same time have been made aware of the socialistic tendencies in our country. We hope we have so directed their opinions that they too, as individuals, will join medicine's crusade for American principles.

Other Auxiliary activities include: Showing of a vocation film on nursing by the Third district. This film was shown to approximately 500 high school students. A nurse in uniform was in attendance to answer questions.

Literature on socialized medicine was placed in places accessible to the public.

A number of the Auxiliary groups devoted their meetings to educational programs. The programs in many instances were such as lead to better trained personnel for the National Education program.

Our state president, Mrs. Berg, traveled in England this past year and gathered first-hand information on the British health program. In her daily contacts with people and by talks to various groups Mrs. Berg has given much time to the subject "How We May Help Combat Socialized Medicine."

After the report was given on Public Relations, Mrs. Berg stated that she thought Dr. and Mrs. Wright deserved a great vote of thanks on the wonderful work they had done on their paper, "Socialized Medicine."

Press and Publicity

As press and publicity chairman I have made contact with all of the district auxiliaries in an effort to get news that might be of interest in the Quarterly News Letter. With a few exceptions the response has been light. This has probably been due to the fact that the groups were slow in getting organized, or that they underestimate the work that they are doing.

From time to time I have received literature against socialized medicine from the National Education campaign headquarters of the A.M.A. and have placed such material in the hands of several people in town who have presented it before clubs, P.T.A.'s and other organizations.

With a little well-directed effort much more could be done by the publicity chairman to further the cause which is uppermost in the minds of all medically-minded people, the fight against socialized medicine.

MRS. LEON J. ALGER, Chairman

Program

The Woman's Auxiliary to the North Dakota State Medical Association followed the program outlined by the national program committee. Naturally, the emphasis was placed on compulsory health insurance versus voluntary prepayment plans, and the component auxiliaries all chose some phase of this problem for discussion and study. In addition, many other subjects were discussed, including nurse recruitment, state and city health service, the twelve-point program of the A.M.A. for the advancement of medicine and public health, and rural and school health problems and solutions.

The Auxiliary of the state of North Dakota also attempted to bring before as many organizations and public groups as possible the stand of the American Medical Association on socialized medicine. This was considered a "must" project and received the full cooperation of the entire Auxiliary. The interest engendered by these speeches was very gratifying, as many people had questions they wanted answered in connection with socialized medicine. In addition, material and papers on the subject were made available to any group who wanted information.

The Auxiliary as a whole has advanced the cause of voluntary prepayment plans very substantially during this year due to the time and effort they have put forth in presenting the problems of the medical association to the general public.

MRS. A. P. NACHTWEY, Chairman

In Mrs. Baillie's absence, Mrs. F. E. Weed read the following report of the nominating committee:

Nominating Committee Report

President-elect—Mrs. R. W. Rodgers, Dickinson.
First Vice-President—Mrs. G. G. Thorgrimson, Grand Forks.
Second Vice-President—Mrs. Henry Kermott, Minot.
Recording Secretary—Mrs. John Jansonius, Jamestown.
Treasurer—Mrs. R. D. Nierling, Jamestown.

Councillors (elected by the various districts)—
Councillor for First District—Mrs. L. E. Wold, Fargo.
Councillor for Third District—Mrs. G. D. Gertson, Grand Forks.
Councillor for Sixth District—Mrs. E. Salomone, Elgin.

Nominating Committee:
MRS. W. F. BAILLIE, Chairman
MRS. PAUL COOK
MRS. F. E. WEED
MRS. D. J. HALLIDAY
MRS. C. R. DUKART

Historian's Report

As all events and business of the 1949 meeting at Minot are recorded in the various files, I shall write no separate report. It seems to me that the work of any historian is to keep records rather than to make long reports and therefore I have tried to include in the files all necessary data.

If each district historian would send a copy of her history, including any unusual event in her district to the state historian at an earlier date (at least a month before the state meeting), we could be sure to have records of all important occurrences.

MRS. N. O. RAMSTAD, Historian

"Today's Health" Report

Membership: 224. Total subscriptions: 21 one year, 3 three year. Subscriptions as sold by county: (a) Cass, 1; (b) Southwestern, 0; (c) Stutsman, 2; (d) Devils Lake, 18; (e) Rugby, 3 - 3 year.

MRS. CHARLES HEILMAN, Chairman

Auxiliary President's Report—First District

The First District auxiliary is comprised of members from Cass, Ransom and Richland counties. Of an eligible number of 75, there are 44 paid-up members, an increase of six over the previous year.

Our meetings are held four times a year at which we have dinner followed by a speaker and we have averaged 32 members at these meetings. The first two were concerned with health problems in North Dakota; at the third, we had as our guest Mrs. H. M. Berg, the state president, and our last was purely social, featuring a fashion show of spring and summer clothes.

Our primary concern this year was the distribution of 38 copies of the Brookings Institute report on compulsory health insurance. These were placed in libraries throughout the counties, both school and public libraries.

In addition, we cooperated with the city health department in Fargo by donating children's clothing which was then distributed by the public health nurse.

In checking with the doctors and clinics, we have found 21 subscriptions to *Today's Health* and hope that by next year we can report every office with a subscription.

MRS. B. C. CORBUS, JR., President

Auxiliary President's Report
Grand Forks District

The Woman's Auxiliary to the Grand Forks District Medical Society held six meetings the past year with an active membership of 30, out of 48 prospective members. The average attendance has been 20. The meetings consist of a dinner-business session, followed by a social hour at the home of a member.

October 6, 1949, Mrs. G. G. Thorgrimson represented this auxiliary at the board meeting at Bismarck, due to the inability of the president to attend.

The copies of the Brookings report were purchased and are to be placed in the public library and the University of North Dakota library.

Five programs were presented with the paper on socialized medicine prepared by Dr. and Mrs. Willard Wright. This was presented to a church group, two study clubs, two civic groups. In all, about 100 people heard the paper.

In a survey of all doctors, dentists and public health offices it was found that *Today's Health* is being subscribed to. Perhaps more subscriptions can be obtained later on.

On February 11, 1950, an executive board meeting was held with the state president, Mrs. H. M. Berg, attending. Plans were outlined for the state convention to be held at Grand Forks, May 29, 30 and 31. The auxiliary is at present busy perfecting plans for this coming event.

Election of officers was held at the April meeting with installation being held at the May meeting.

MRS. W. A. LIEBELER, President

Auxiliary President's Report
Traill-Steele District

We have a total of ten members and two new ones will be taken in this year. Four subscribe to the *Bulletin*, and two to *Today's Health*.

We gave three subscriptions of *Today's Health* to local hospitals.

None of our members gave talks on socialized medicine this year. Several mentioned discussing it informally and calling attention to articles on the subject. Another said she had distributed a lot of literature on the Health bill. Pamphlets and reprints, etc., are on display in our doctors' waiting rooms. Last year I had the opportunity to give a talk on socialized medicine to our Woman's club.

We have not donated any copies of the Brookings Institute report to high schools or libraries.

I am sorry to have to turn in a report of so little activity on our part, and I hope we will have a more active year coming up. We do enjoy our meetings and try to attend as many as possible. However, the group decided at one of our first meetings that they wanted to remain social and informal, so it is hard to get any other program into effect.

MRS. T. M. CABLE, President

Auxiliary President's Report
Devils Lake District

There are 18 doctors' wives eligible for membership, there are 16 members this year, 14 members a year ago, with a gain of two new members.

Auxiliary meetings: We hold four meetings a year if weather permits, the average attendance this year has been ten members. The meetings have been devoted to routine business and educational programs. The nurse recruitment program which was not completed by the time our last year's report had to be sent in proved a big success. This program included the showing of a vocational film on nursing which was introduced by a graduate nurse in uniform, who was available to answer questions after the film was shown. These programs were attended by 486 students, mostly seniors, in the various towns of the district.

The programs at our meetings have been educational and at only one program did we depend upon an outside speaker. The address by Mrs. Wright to acquaint the public with the facts on socialized medicine was read at one of our meetings and this same address was used for several programs and clubs throughout the district. Our organization encouraged the drug stores to enclose literature on socialized medicine in their monthly statements. At one of our meetings the members visited the fire hall and the fire chief gave us an interesting program on the functional purposes of the ambulance and iron lung. An extensive program and discussion was had at our April meeting on President Truman's health bill.

Five of our members are on committees which represent health care. Our four letters were submitted to the Senate relative to House Bill 122.

Our *Hygeia* (*Today's Health*) chairman was not informed of her duties until too late in January to work on the subscription campaign last year, so this year we started early. We received 18 one-year subscriptions and 3 three-year subscriptions. Several members donated subscriptions to public and club libraries to acquaint the public with the magazine. The president gives a brief report on *Hygeia* every month to her homemakers club and it has created much interest among its members.

We have no philanthropic work to report, our social activities have been limited to dinner meetings of the auxiliary and our publicity is reports of meetings in the local papers.

MRS. L. S. GERBER, President

Auxiliary President's Report
Sheyenne Valley District

The membership of the Sheyenne Valley Medical Auxiliary remains at ten. We have had four afternoon meetings through the year with an average attendance of six. At each meeting one of our members has presented a well-prepared paper on some current medical issue, all of which were very interesting and educational.

Our group was sponsor of a Nurse Recruitment booth at the recent winter show. Local nurses were in attendance, the booth was visited by many people, and literature for distribution on the nursing profession was available to those interested.

Two volumes of the Brookings Institute report were purchased and presented to the Valley City Teachers College Library, and to the Valley City public library. *Today's Health* magazine is subscribed to by all members and the magazine finds a place in all of the doctors' offices, as well as being in use in the S.T.C. library and the Valley City library.

We have a very cordial group, and we do enjoy the sociability that is exchanged at our meetings over the coffee cup.

At our April meeting the following officers were re-elected for the coming year: Mrs. W. H. Gilsdorf, president, and Mrs. C. J. Meredith, secretary-treaurer.

MRS. W. H. GILSDORF, President

Auxiliary President's Report—Third District

The Woman's Auxiliary to the Third District Medical Society has held five meetings the past year. The weather has been most unkind and forced us to cancel three meetings. We have 35 active members and have had an average attendance of about 20 persons at the meetings.

Two papers on socialized medicine have been given with our assistance to two woman's clubs in Minot.

Our auxiliary has assisted with the diabetic clinic, the TB mobile x-ray unit, and served lunch to hospital auxiliaries.

We have been guests of the Third District Public Health Unit on two occasions when conferences on speech defects and the legal aspects of public health were held.

The auxiliary is looking forward to a more active year in 1950-51 under the leadership of Mrs. Clayton Halverson, president, Mrs. A. L. Cameron. vice-president, Mrs. John Spomer, secretary, and Mrs. O. S. Uthus, treasurer.

MARJORIE KERMOTT, President

Auxiliary President's Report
Southwestern Medical Society

The Women's Auxiliary to the Southwestern Medical Society now consists of thirteen members, seven of whom are subscribers to the Bulletin.

The program of the auxiliary for the year 1949-50 was as follows: (1) Truman's compulsory health insurance plan—A.M.A.'s answer to compulsory health insurance; (2) Twelve-point program of the A.M.A. for the advancement of medicine and public health, and (3) Rural health problems and school health program.

The auxiliary cooperated with the doctors in putting on the diabetic drive in October, 1949. They also purchased two copies of the Brookings Institute report and placed them where they thought they would do the most good.

There were no speeches given before organizations by any member of the auxiliary.

At the present time we have ten subscriptions to *Today's Health*.

MRS. A. P. NACHTWEY, President

Auxiliary President's Report—Sixth District

The Sixth District Medical Auxiliary has been marked by a gradual increase of its membership and with greater interest in its activities. There are 36 active paid-up memberships.

There are four auxiliary meetings a year. These are dinner meetings with a program and are held the same night that the physician husbands of the Sixth District Medical Society meet.

The first meeting of the fiscal year was held on October 28, 1948. Mrs. H. M. Berg, president of the State Medical Woman's Auxiliary, gave an address on a recent trip to Europe. She outlined socialized medical problems observed in Europe. At this meeting, an explanation of the fiscal year of this association was stressed and its importance emphasized. This has been a point of confusion to many of the members.

The second meeting was held on December 13, 1949. The program was devoted to the reading of the address on socialized medicine prepared by Dr. and Mrs. W. A. Wright. An active discussion followed this address. The presentation of the points of the paper on socialized medicine to the local communities has been the main project of this auxiliary.

The third meeting was held on February 28, 1950. Dr. Walter Swensen, director of mental hygiene for the State Health Department, spoke on the topic "These Are Our Children."

It is planned to have a fourth meeting the last of April or the first part of May. The program will be devoted to the subject of cancer, with proposed speaker and films from the State Cancer Society. At this meeting there will be election of officers and the naming of delegates to the State Auxiliary Medical meeting.

During the year two memorial letters have been written on recently departed members, Mrs. F. F. Griebenow and Mrs. R. W. Henderson. These letters have been filed with our state historian.

MRS. C. A. ARNESON, President

Auxiliary President's Report—Kotana District

The number of active members is nine; the number of eligible members, 11; and the number of meetings held during the year is two.

Activities for the year included placing of literature on socialized medicine in places available to the public, and purchasing a subscription to *Today's Health* for the Public Library. Our major project for the year has been the carrying out of an active program of public education on the subject of socialized medicine. This was done by talks to women's clubs and organizations and other groups in the community. Approximately 500 people heard the talks on socialized medicine.

As a result of our education program, we feel we have helped the people of our community to gain a better understanding and be better informed on the issue of socialized medicine. The talks have also served as a means of making the people more aware of the socialistic tendencies in our country. Community interest in the problem has been widened. People are reading more, discussing and talking more about socialized medicine. On the whole, we feel the people have been favorably impressed by our educational program and that the project has been very worth while.

MRS. ALAN K. JOHNSON, President

Auxiliary President's Report
Stutsman County District

The paper on socialized medicine was given at the academy here for their P.T.A. and the audience numbered about 80. I hope to promote it at other P.T.A.'s but will probably have to wait until next year.

We had only two new subscriptions for *Today's Health*, which Mrs. Sorkness handled. Our organization subscribes to two Bulletins. We have 22 members.

Our program for the year was as follows:

Community Activity (1) Served for two days in assisting mobile x-ray unit, (2) Gathered food and clothing for two unfortunate families at Christmas, (3) One member promoted talk on socialized medicine at P.T.A.

Meetings of woman's auxiliary included (1) Dinner and motion picture, "Your Health Department in Action"; (2) Dessert and visit of state president. Talk on "Prepaid Medical Insurance of a Voluntary Plan," by Mr. Engebretson, executive secretary, North Dakota State Medical Association; (3) Dinner. Talk by county welfare chairman on "Opportunity to Aid Unfortunates in this Community." (4) Dessert and business meeting. Election of officers.

MRS. R. D. NIERLING, President

REVISIONS REPORT

Proposed Changes to the Constitution and By-Laws

CONSTITUTION

Article IV, Section 2

"Members in good standing of the component auxiliaries are active members of this auxiliary. Wives of physicians who are members in good standing of local medical societies or widows of deceased physicians who were in good standing of local medical societies at the time of their death are eligible for active membership." (We suggest omitting section 3 of this article. If at a later time wives of interns, members of the armed services, etc., want to be included that can be added. For now we felt that this would be sufficient.

Article V, Section 3, Subsection 3

Is not one delegate for every five members a small ratio? As long as the smaller groups are taken care of, we suggest a ratio of at least one delegate for each ten members or even for each twenty-five members over two or three delegates for each group. In our First District, according to last year's membership, we were entitled to eight delegates beside the president, but they just weren't available. How do the other larger groups feel about this?

Article VI, Section 1

Since several of the groups have merged, is it still necessary to have ten councillors, or one for each group? Would their duties not be as well or better performed if they each had several groups to work with?

Section 2

We should like to reword this section to read:

"The president-elect, the vice-presidents, the recording secretary, and the treasurer shall be elected annually by the Convention and shall assume office at the close of the Convention, at which they were elected, and shall serve until the corresponding period of one year hence or until their successors are elected and installed. The president shall not serve for a longer period than one year, except in case of an emergency so determined by the advisory council of this auxiliary."

(We have stricken out the "provided however." We also wondered if the advisory council is the correct group to determine this. Would not our board of directors be better?)

Section 3

We should like to reword this section to read:

"On the expiration of her elective-term, the president-elect shall serve as president for the succeeding year or until her successor is installed. If by reason of death, or refusal or failure to serve or qualify or other reason, the office of president or president-elect becomes unoccupied, the first vice-president shall succeed to the office vacated, with all the prerogatives and duties pertaining to the office, and serve as such for the unexpired portion of the term."

Article VII, Section 1

The board of directors seems large for a working group. After several years would it not be top-heavy with past presidents besides enlarging the group still further? We suggest that the immediate past president be sufficient and that the section be reworded to read:

"The board of directors shall consist of the officers enumerated in Article VI, Section 1 of these by-laws, the chairmen of standing committees, the immediate past state president, and the president of each component auxiliary."

BY-LAWS

Chapter II, Section 1

We think it simpler and clearer to change the "provided however" to "except", so that it will read:

"Officers shall be elected at the annual convention and installed at the same meeting, except, that the corresponding secretary shall be appointed by the incoming president."

Chapter III, Section 2

We all had to look up the meaning of "devolving." It seemed simpler to use "delegate," which is more easily understood. We suggest the chapter read:

"The president shall be the presiding officer of the board of directors and of the convention. Subject to the confirmation of the board of directors, she shall appoint the chairmen of the standing committee. She shall appoint such committees as she may deem necessary, provided, that no special committee shall be appointed to assume any of the duties delegated by these by-laws to any standing committee, etc."

Section 7

We suggest that a fourth subsection be added to the duties of the corresponding secretary. This is contained in Article V, Section 3 of the constitution. It would read:

"4. On the basis of the statement received from the treasurer by March 15 annually, as to the number of paid members in each component auxiliary, determine the number of voting delegates to which each component auxiliary is entitled that year and shall accordingly notify the president of each component auxiliary by April 1st."

Section 8

We feel that having the president sign all vouchers before the treasurer can pay bills is a very delaying procedure. Is this necessary in view of the fact that a report is given at all board meetings and an audit is made at the end of the year? If everyone still feels that it is, then I suggest that we add two more subsections to read:

"2. Committee and officer expenses not to exceed the amount allowed for this in the budget."

"3. Expenses approved by vote at the convention or at board of directors meetings."

We also suggest that subsection (b) be added here to correspond to the one suggested for the corresponding secretary taken also from Article V, Section ...... of the constitution, to read:

"(b) The treasurer shall submit to the corresponding secretary a statement as to the number of members of each component auxiliary whose dues to this auxiliary are shown by the books of the treasurer as of March 1 to be paid."

Chapter IV

We suggest that a finance committee be added to this list. It could be made up of three members, the chairman to be appointed by the president, and the other two members consisting of the past and the present treasurer. Maybe it should have two other members also, so that the committee could also take care of auditing the books.

Chapter IX

For an opinion on this chapter I consulted a lawyer friend. His verdict was that it is correct as it stands. To quote "After an amendment is passed, even though it adds an entirely new chapter to the by-laws, it then becomes an actual part of the by-laws and provisions of Chapter IX operate against it as well as against the original by-laws."

I should like to add that it is stated quite clearly that new officers be installed at the annual meeting. From the standpoint of the Treasurer, it should also state that the books should be closed at that time and that any bills presented to or passed by the convention should be paid by the new or incoming treasurer. This year the last bill didn't come in until August 1st and the new treasurer received the books so late that she couldn't possibly get the material out to the component auxiliaries for their first fall meeting. It seems to me that it would be much easier this way.

Mrs. V. G. Borland

A motion was made by Mrs. Quale, seconded by Mrs. Weed, that all reports be accepted as read and that the said reports be placed on file.

The convention then adjourned to reconvene at 2:00 P.M. the same day in the Dacotah room, Dacotah hotel.

The Woman's Auxiliary to the State Medical Association reconvened at 2:00 P.M. in the Dacotah room, Dacotah hotel, Grand Forks, on Monday, May 29, 1950. The meeting was called to order by Mrs. Berg, president.

Mrs. Berg then requested the secretary, Mrs. Jansonius, to read the "Proposed Changes to the Constitution and By-Laws of the Auxiliary," which the Revisions committee had recommended, and called for comments upon these.

Article V, Section 3, Subsection 3: It was moved by Mrs. Liebeler that the constitution be changed to a ratio of one delegate for each twenty-five members. The motion was seconded by Mrs. Keller, and upon vote carried.

Article VI, Section 1: Before group discussion ensued on the suggested revision, Mrs. Keller stated that she thought the councillors should be given a definite responsibility. She suggested they might assist in obtaining news for the news-letter. This matter was left undecided at this time. On the suggested revision, Mrs. Berg thought it advisable to leave one councillor for each group. Mrs. Corbus stated that several districts had grown; therefore, it was decided by the group it should be left as stated in the constitution.

Article VI, Section 2: A motion was made by Mrs. Alger, seconded by Mrs. Weed, that the board of directors rather than the advisory council should be the one to determine the clause in Section 2. Motion carried.

Article VI, Section 3: A motion was made by Mrs. Alger, seconded by Mrs. Mahowald, that we accept the revision on Section 3. Motion carried.

Article VII, Section 1: A motion was made by Mrs. Keller and seconded by Mrs. Rodgers that we accept the revision that the immediate past president be the only state president on the board of directors. Motion carried.

Chapter II, Section 1: It was unanimously agreed that this revision be accepted.

Chapter III, Section 2: Mrs. Mahowald suggested that we accept the revision. It was accepted by the group.

Chapter III, Section 7: Motion was made by Mrs. Kermott, seconded by Mrs. Culmer, that we accept the proposed change. Motion carried.

Chapter III, Section 8: After very lengthy discussion on this section, it was decided that the clause stating that the president sign all vouchers remain in effect; however, Mrs. Rodgers suggested that all bills be presented at convention time; then the president could sign them at that time for the disposition of funds. The group concurred in this suggestion.

Chapter III, Section 8b: A motion was made by Mrs. Rodgers and seconded by Mrs. Keller that we add Section b to Section 8.

Chapter IV: After it was decided that the Finance committee should prepare the budget, Mrs. Kermott made the motion that we accept the addition of a Finance committee to the list. Mrs. Dailey seconded the motion, which upon vote carried.

Chapter IX: It was decided to leave this chapter as it stands in the constitution.

Mrs. Berg then introduced the guest speaker, Mrs. David B. Allman, president, Woman's Auxiliary to the American Medical Association. Mrs. Allman stated that she and her chairman had traveled over 50,000 miles in order to attend meetings in an attempt to effect a closer relationship between the National and State auxiliaries. She praised the counties and states (since they were the grass roots of the national auxiliary) for the magnificent job they were doing. She stated that the women had been highly commended by the A.M.A. and N.E.C. She stressed the great need for more subscriptions to the Bulletin. She called attention to the fact that the Handbook hadn't been revised since 1942, but a revisions committee was being appointed, and that reprints of the "Model Plan of School of Instructions" would be contained in it. She praised Mrs. Leo Schaffer, program chairman, for her splendid work. She then gave a resume of some of the projects being tried in various states. Some highly beneficial and successful ones were: Benevolence funds, scholarship funds, and student nurses scholarship funds. She mentioned that North Dakota had been the "baby state" in organization until just recently.

Since there was no unfinished business to come before the meeting, Mrs. Berg asked for the new business.

It was moved by Mrs. Keller and seconded by Mrs. Alger that the councillors take over the job of getting the news for "Press and Publicity" to Mrs. Alger, chairman of Press and Publicity.

After much discussion on the feasibility of various projects that the North Dakota Woman's Auxiliary might undertake, Mrs. Liebeler made the motion that the president have the authority to appoint a committee to study these projects, and present their ideas to the convention next year. Mrs. Weed seconded the motion which, upon vote, carried.

In the absence of Mrs. Baillie, chairman of the nominating committee, Mrs. Weed again read the report of the nominating committee.

Mrs. Berg then asked for nominations from the floor for these offices. As there were none, she then requested a motion nominating the group of officers. It was moved, seconded and carried, that the secretary be instructed to cast a unanimous ballot for the entire group of officers.

Mrs. Rodgers then asked that all bills be presented immediately following the meetings, or the next morning at the latest.

Meeting then adjourned.

The annual Auxiliary Banquet was held at the Red River Terrace room, Dacotah hotel. Mrs. V. S. Quale presided. Mrs. Thorgrimson announced the very interesting program. Mrs. Allman gave a short address in which she stressed the necessity of fighting constantly against socialized medicine. She stated that after much work the tide of battle against socialized medicine had turned in our favor, but she urged that we be on the offensive until the battle was won.

The last business session of the Woman's Auxiliary was held at the Dacotah room, Dacotah hotel, May 30, 10:00 A.M.

Mrs. Berg called the meeting to order. The first order of business was the decision to have Mrs. Keller obtain her ticket for the trip to the national convention at San Francisco, and send the bill to Mrs. Nierling, treasurer.

Mrs. Keller then made a motion to have a note of sympathy sent to Mrs. Baillie. Mrs. Thorgrimson seconded the motion, which upon vote carried.

It was moved by Mrs. Kermott and seconded by Mrs. Benson that the following be appointed as delegates to San Francisco: Mrs. W. A. Wright and Mrs. C. J. Meredith as delegates, and Mrs. N. A. Youngs, alternate. Motion carried.

Mrs. Keller made a motion that Mrs. G. W. Toomey be the alternate delegate to the A.M.A. convention. Motion was seconded by Mrs. Culmer, and upon vote carried.

Mrs. Berg then left the floor open for group discussion. She stated how amazing she thought it was in Florida when the Federated Women's groups had things so well organized, and made such a drive that they defeated a very important measure. She used this as an illustration of what we could do.

Mrs. Berg then turned the meeting over to Mrs. Allman, who requested that all the new officers stand. She then congratulated them on their new duties and formally installed them in their new offices.

Mrs. Berg then thanked the auxiliary for their cooperation during her tenure as president, and turned the meeting over to the new president, Mrs. E. T. Keller, Rugby.

Mrs. Allman then asked that the group give a rising vote of thanks to the outgoing president.

Mrs. Keller then appointed the following state committee chairmen:

Historian—Mrs. A. E. Culmer, Grand Forks; Organization—Mrs. R. W. Rodgers, Dickinson; Bulletin—Mrs. N. B. Livingston, Mohall; Public Relations—Mrs. J. C. Fawcett, Devils Lake; Press and Publcity—Mrs. L. J. Alger, Grand Forks; Program—Mrs. A. P. Nachtwey, Dickinson; *Today's Health*—Mrs. C. O. Heilman, Fargo; Revision—Mrs. W. E. G. Lancaster, Fargo; Parliamentarian—Mrs. J. R. Pence, Minot; Nominating committee—Mrs. H. M. Berg, Bismarck; Finance committee—Mmes. D. J. Halliday, Kenmare; R. W. Rodgers, Dickinson; R. D. Nierling, Jamestown; C. J. Meredith, Valley City; T. Q. Benson, Grand Forks.

Mrs. Keller stated that Mrs. W. R. Fox, Rugby, had been appointed corresponding secretary.

There being nothing further to come before the meeting, it was duly moved, seconded and carried that the meeting be adjourned.

POST-CONVENTION MINUTES

Meeting was called to order by Mrs. Keller. She then asked for minutes of the pre-convention board meeting, but Mrs. Jansonius reported no business was brought up; therefore, there were no minutes.

Questions and discussion then ensued as to the duties of the state committee chairmen. Files were turned over to the new chairmen.

Mrs. Boyum stated that they were still known as Tri-County; had sent in their membership list, but no dues.

Mrs. N. B. Livingston, new Bulletin chairman, was instructed to write all local officers and stress the fact that the Bulletin was an essential part of their work. Mrs. Allman stated that only ten per cent had subscribed to the Bulletin, but she thought it so informative and instructive that it should be in the hands of all members.

Motion was made by Mrs. Liebeler, seconded by Mrs. Haunz, that dues for local auxiliaries be paid to the local treasurers by February 1. Motion carried.

Mrs. Wright, past public relations chairman, stated that the paper prepared by her and Dr. Wright was out of date, and that the A.M.A. recently had produced four-minute recordings on the subject of socialized medicine to be sent to each state.

It was then decided that each district *Hygeia* chairman should send in her subscriptions to *Today's Health* to Mrs. Heilman, state chairman.

Mrs. Corbus, Mrs. Fawcett, and Mrs. Haunz were appointed to serve on the Project committee.

Mrs. Nachtwey and Mrs. Dukart were appointed by Mrs. Berg to audit the books.

Mrs. Halliday presented the following budget for the auxiliary for the fiscal year 1950-51.

INCOME	
Balance	$617.25
From State Medical Association	200.00
Deferred dues	14.00
Total Income	$831.25

PROPOSED EXPENDITURES	
President:	
(1) Discretionary fund (visiting districts and entertaining guests, etc.)	$ 50.00
(2) Miscellaneous fund (telegrams, telephone and postage)	25.00
(3) Toward expenses to board meeting	50.00
(4) Railroad fare plus $50.00 to the national convention	225.00
President-elect (1) board meeting	50.00
Standing committees (12 to have $5.00 each)	60.00
Convention fund	200.00
Miscellaneous	171.25
Total	$831.25

After a discussion, Mrs. Kermott made a motion that the budget be adopted. Mrs. Weed seconded, and upon vote the budget was declared adopted unanimously.

It was then duly moved by Mrs. Corbus, seconded by Mrs. Culmer, that the meeting be adjourned.

The last event of the convention was the luncheon held at the Main Diningroom, Ryan hotel, with Mrs. G. G. Thorgrimson presiding. An entertaining program was given and Dr. Larson, president of the North Dakota State Medical Association, 1950-51, gave a short address in which he stressed the importance of defeating socialism in any form. He thought women could play a very vital role in accomplishing this measure.

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The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatrics Society

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Editorials

CLINICAL ENDOCRINOLOGY

It is imperative that we appreciate the significance of the new advances in the field of clinical endocrinology. New concepts of the etiology, pathogenesis, physiology and treatment of a host of diseases are being evolved, which may well revolutionize our thinking.

In 1946 Selye presented his general adaptation syndrome, which emphasized the reactions of the endocrine glands in the body to various forms of stress. This concept has been expanded to suggest that many chronic diseases of man are due primarily to the failure of the body to adapt itself to stress or to side reactions to the endocrine mechanisms set into operation. Earlier theories, including Claude Bernard's "internal equilibrium," Cannon's "homeostasis," and Crile's "kinetic" theory of shock gave recognition to the endocrine system's regulatory role in human physiology. Four years ago Thorn and his co-workers at Harvard began their observation of the effects of ACTH administered to humans. Since then many outstanding investigators throughout the country have done considerable research on the pituitary-adrenal axis in its relation to numerous and apparently diverse diseases. These works culminated in the first Clinical ACTH Conference, arranged by Armour and Company in October, 1949. The use of an adrenocortical hormone (Cortisone) (Compound E, Kendall) in rheumatoid arthritis by Hench, Kendall and their associates at the Mayo Clinic, starting in September 1948, provided added impetus. Now that ACTH and Cortisone have been made widely available, a working knowledge of the physiology of the adrenal cortex is a prerequisite to their employment in treatment.

It is obligatory that an essential gland such as the adrenal cortex must modify the body metabolism either by too little or too great activity. The mechanisms involve changes in the elaboration of the three groups of adrenal cortical steroid hormones, viz.: the desoxy-like "salt" hormones, the cortisone-like "S" hormones, and the androgenic "N" hormones. These corticoids act on target organs (peripheral body cells) to produce their profound clinical effects. The regulation of the corticoids, in turn, is dependent upon ACTH (and possibly other adrenocorticotropic hormones) of the anterior pituitary gland. The pituitary itself secretes ACTH in a compensatory manner when blood levels of corticoids fall. Epinephrine also stimulates the anterior pituitary. And there is evidence that the posterior hypothalamus may influence the anterior pituitary to release ACTH—which would tend to establish psychosomatic ailments on a rational basis.

It is generally believed at the present time that ACTH and/or Cortisone are most useful in the treatment of Addison's disease, idiopathic hypoglycemia, panhypopituitarism, acute rheumatic fever, allergic diseases, gout, and certain diseases of the eye. The choice of hormone depends upon the individual condition to be treated. On the other hand, these hormones are detrimental to and aggravate: Cushing's syndrome, hypertension, diabetes, heart failure, peptic ulcer, osteoporosis and acne. These observations are in accord with the known biochemical effects of ACTH and Cortisone which have been recently presented by various authors. Then there is a long list of diseases which are benefited in varying degree, including rheumatoid arthritis and other collagen diseases, ulcerative bowel syndromes, the nephrotic syndrome, multiple myeloma and psoriasis. The proper status of these conditions and many others will be clarified by further research. At this time, however, in the general run of the mill patient load of most practitioners, the use of these new hormones will be more often contraindicated—or not indicated at all, rather than otherwise. On the other hand, when a clear cut indication presents itself, therapy should be directed, along prescribed lines, with the expectation of obtaining an almost specific effect. The objective of all therapy should be to cooperate with, but not supplant, the patient's pituitary-adrenal system by judicious stimulation.

The use of radioactive iodine in the diagnosis and treatment of thyroid disease continues to be spectacular. Advances in our knowledge of all the other glands of internal secretion are also steadily taking place, although overshadowed by those mentioned above.

Although hormones have long been compared to catalysts in facilitating chemical reactions in the body, the exact mechanisms of their action have not yet been established. Most authorities agree that their basic influence is exerted at the cellular level, possibly by modifying the permeability of the cell membrane. It is true that we cannot yet correlate the dramatic clinical effects with our present knowledge. Continued research in biochemistry, particularly enzyme chemistry, will further elucidate fundamental facts regarding physiology and pathologic physiology, thus indicating factors in the etiology and treatment of diseased states in general.

A. C. GRORUD, M.D.,
Quain and Ramstad Clinic, Bismarck, No. Dak.

UNIVERSITY PLANS FALL SEMINARS

Six professional medical postgraduate seminars will be held in Minnesota during 1950-51. Sponsored by the University of Minnesota School of Medicine, in conjunction with the Minnesota State Medical Association and the Minnesota Department of Health, these seminars mark a significant step in medical education.

The areas, together with approximate attendance dates, are these:

	1950
Crookston	September 13 to November 1
Virginia	September 21 to November 9
	1951
Moorhead	January 3 to February 21
Willmar	January 11 to March 1
Worthington	March 6 to April 24
Albert Lea	March 14 to May 2

News Briefs

North Dakota

Dr. L. W. Larson of Bismarck was one of two members elected to the board of trustees of the American Medical Association at its convention in San Francisco.

* * *

Licenses to practice medicine in North Dakota were granted 20 men following completion of examinations given recently by the state board of medical examiners at Grand Forks.

Newly-licensed doctors, their home addresses listed first and their intended place of practice listed second, are:

Raymond A. Vaaler, Grand Forks, none; Richard B. Bridenbaugh, Billings, Mont., Bismarck, N. D.; Robert E. Hulit, Ashland, Ohio, Minot, N. D.; Marcus P. Greaber, Aberdeen, S. D., Wishek, N. D.; Richard P. Storrs, Rochester, Minn., Fargo, N. D.

Mitchell A. Spyker, Columbus, Ohio, Minot; Milton E. Nugent, Aberdeen, Bismarck; Arthur S. Rathkey, Minneapolis, Grand Forks; Richard B. Kling, Bismarck, Bismarck; Harold Kirk, Devils Lake, Devils Lake; Joseph J. Jestadt, Winnipeg, Canada, Gackle, N. D.; Edward H. Goodman, Bantry, N. D., Rolla, N. D.; David H. Stein, Winnipeg, Rolla.

Ross A. Lewis and Simon W. Chiasson, Vanguard, Canada, Richardton, N. D.; Harold C. Deering, Tacoma, Wash., none; Keith Vandergon, Delano, Minn., Mohall, N. D., and Fred D. McDade, Scoby, Mont., none.

Two displaced physicians, Dr. Ilmar Kiesal, an Estonian, who has been living at Fargo, and Dr. Tiber A. Osten, a Czechoslovakian, also living at Fargo, were granted temporary restricted licenses. Dr. Kiesal will practice at Page, N. D., and Dr. Osten will practice at Michigan, N. D.

* * *

At the annual meeting of the North Dakota Pediatrics Society, the following officers were chosen for the year 1950-51: president, Dr. L. G. Pray of Fargo; vice-president, Dr. B. A. Mazur, Fargo; secretary-treasurer, Dr. W. J. Ball, Minot. The next meeting will take place at the Northwest Clinic, Minot, on October 28, 1950.

* * *

Governor Fred G. Aandahl has made the following reappointments to the state board of medical examiners for three-year terms: Dr. F. E. Weed, Park River; Dr. W. A. Wright, Williston, and Dr. A. E. Spear, Dickinson.

* * *

Dr. Douglas T. Lindsay assumed his duties on July 1 as head of the staff of crippled children's services of the North Dakota state welfare board as medical director. Dr. Lindsay received his M.D. degree from the University of Minnesota medical school in 1945. For the past year he has been a teaching assistant in the department of orthopedic surgery at the Harvard medical school and at the children's hospital in Boston.

* * *

Dr. Napoleon A. Chagnon, 76, former Fargo physician, was honored recently at Port Austin, Michigan, where he has practiced nearly 30 years. Many of the 6,000 children at whose birth he attended participated in the observance. Born in Montreal, Canada, Dr. Chagnon received his medical degree in 1898, practiced for a time at Neche, N. D., and came to Fargo about 1915.

* * *

A parade of "babies of Dr. Goodman" was one of the features of an all-day program in which residents of territory tributary to Powers Lake were celebrating "Dr. Robert Goodman day," on July 17. The physician was marking the 20th anniversary of his arrival in Powers Lake.

* * *

Friends of Dr. W. H. Bodenstab called at the Bodenstab home in Bismarck Sunday, June 25, to pay their respects to the pioneer doctor on his 80th birthday anniversary. Still active in his profession, Dr. Bodenstab has practiced medicine in North Dakota since 1898, when he located at New Salem. The Bodenstabs have lived in Bismarck since 1910.

* * *

New Locations and Appointments . . .

Dr. A. B. Narbutas has opened a medical practice in Bottineau in association with Dr. J. A. Johnson. A graduate of the medical school of Kaunos in Lithuania, Dr. Narbutas recently completed a year's internship at Oak Park Hospital in Oak Park, Illinois.

Dr. Glenn L. Wiltse has joined the firm of Dr. E. R. Wasemiller and Dr. M. E. Beltz to form the new Wahpeton Clinic. Dr. Wiltse, a graduate of the College of Medical Evangelists, is a specialist in internal medicine.

The following doctors have joined the staff of the Grand Forks Clinic: John A. Folsom, a specialist in orthopedic surgery; Arthur S. Rathkey, pediatrics; and Raymond A. Vaaler, obstetrics and gynecology.

Dr. Blaine F. Amidon, a graduate of Syracuse University Medical School and a specialist in obstetrics and gynecology, is a new member of the staff of the Dakota Clinic at Fargo.

Dr. Archie G. Gray of Winnipeg, who has been located at Langdon the past year, has opened an office in Rolette.

Dr. Richard P. Storrs, a graduate of Columbia College of Physicians and Surgeons, has joined the staff of the Fargo clinic in the department of radiology.

DR. JOHN RUUD has joined his father, Dr. M. B. Ruud, and his uncle, Dr. H. O. Ruud, in practice in Grand Forks. Dr. Ruud is a graduate of Temple University medical school.

DR. JULIAN TOSKY of Larimore, N. D., has opened a clinic at Richardton. Dr. Tosky is a graduate of the University of Manitoba and the Manitoba Medical college.

Minnesota

TEN YOUNG DOCTORS, all war veterans and all University of Minnesota graduates, will open a new $150,000 medical clinic in St. Louis Park early in 1951. The group includes Drs. Richard Webber, Arnold Anderson, Donald Freeman, Alex Barno, Robert Green, David Anderson, John LaBree, Robert Giebink, Sewell Gordon and Wyman Jacobson.

* * *

DR. MAURICE B. VISSCHER, head of the department of physiology at the University of Minnesota, was elected vice-president of the American Heart Association at its meeting in San Francisco.

* * *

DR. FRANCES KING-SALMON, resident physician at Glen Lake sanatorium, was recently named a fellow of the American Medical College of Chest Surgeons.

* * *

GROUND-BREAKING ceremonies for the $12,000,000 Mayo Memorial center, which is expected to be ready for occupancy sometime in 1953, were held Wednesday, July 5, with President J. L. Morrill of the University turning the first shovelful of earth. Principal speaker at the ceremonies was Dr. Donald J. Cowling, chairman of the Committee of Founders of the Mayo Memorial created by the 1943 Minnesota Legislature. Dr. Harold S. Diehl, dean of medical sciences at the University, presided at the ceremonies.

* * *

New Hospitals Opened . . .

St. Michael Hospital at Sauk Centre was dedicated Sunday, July 9, with Dr. A. S. Adson, chief of the neurosurgery department at the Mayo Clinic, as the principal speaker. The 50-bed, two-story hospital will be operated as a community hospital by the Franciscan sisters.

Dedication of Zumbrota village's new $125,000 hospital took place Friday evening, June 30. Dr. M. G. Flom will serve as hospital chief of staff, and Dr. Oliver Larson as assistant chief of staff. Other staff physicians include Dr. James Halvorson of Goodhue, Dr. J. Boswell of Wanamingo, Dr. Howard Claydon of Red Wing, Dr. E. A. Olson and Dr. Carl McKaig of Pine Island, Dr. M. R. Williams and Dr. George Bagby of Cannon Falls, and Dr. R. Moses of Kenyon.

Valleyview Hospital and Sanatorium, two miles north of Jordan, Minnesota, was dedicated Sunday, July 16.

New Locations and Appointments . . .

DR. LEON and DR. MADELINE ADCOCK, graduates of the University of Minnesota medical school, who are now practicing in St. Paul, will leave soon for the African Gold Coast, where they will serve as missionaries with the Medical Mission Sisters.

DR. B. O. MORK, formerly of Worthington, has been appointed medical director of one of the city of Los Angeles' eight public health districts.

DR. FRANCIS J. BRACELAND of the Mayo Clinic has been appointed as new chairman of the governor's advisory council on mental health.

DR. JOHN R. RISCHER, a graduate of Washington University school of medicine, has moved to Owatonna, where he will be associated in practice with Dr. John A. McIntyre.

DR. W. G. TOMHAVE, a graduate of the University of Minnesota Medical School, has joined the staff of the Mesaba Clinic at Chisholm.

DR. GEORGE W. HEINE has opened a general practice in association with Dr. G. M. A. Fortier at the Little Falls Clinic.

DR. BERNARD S. NAUTH, a graduate of the University of Minnesota, formerly with the Winona Clinic, has opened an office in Bemidji.

DR. MITROFAN SMORSZCZOK, a Polish physician who received his medical license in Minnesota this summer, has started practice in Monticello in association with Dr. William E. Hart.

DR. BARNARD HALL, a graduate of the University of Oregon, and Dr. John B. Coleman, a graduate of Northwestern University, have joined Drs. Schons, Medelman, Peterson and Nash in the practice of radiology in St. Paul.

Meet Our Contributors

ALTON C. GRORUD, a graduate of the University of Wisconsin, practices in Bismarck, where he is chief of internal medicine service at St. Alexius Hospital. He is a member of district and state societies, A.M.A., and the Association for the Study of Internal Secretions; a diplomate of the American Board of Internal Medicine; F.A.C.P. and F.A.C.A.

★

GRAHAM ARMIN KIERNWEIN, a graduate of the University of Chicago Medical school, is chief of the orthopedic section at the Northwest Clinic at Minot, North Dakota. He is a diplomate of the American Board of Surgery and the American Board of Orthopedic Surgery, F.A.C.S., and F.A.M.A.

★

ROBERT B. RADL, a graduate of the University of Minnesota Medical School, specializes in internal medicine in Bismarck. He is a member of the A.M.A., F.A.C.P., the American Diabetes Association, a fellow of the American College of Allergists, and is certified by the American Board of Internal Medicine. He also serves on the North Dakota State Board of Medical Examiners.

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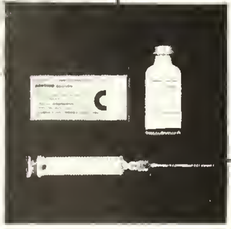

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The JOURNAL LANCET

Minneapolis, Minnesota
October, 1950

Vol. LXX, No. 10
New Series

Palliative Radiation Therapy in Neoplastic Disease*

K. W. Stenstrom, Ph.D. and Jack Friedman, M.D.
Minneapolis, Minnesota

Correct evaluation of the results of roentgen therapy in treatment of neoplastic disease demands a review of all cases of a particular type of neoplasm in which follow-up study has been made. A critical study of this data will establish the five-year cure rate or survival rate. Many such studies have been published by Dr. K. W. Stenstrom and his coworkers from the Department of Radiation Therapy at the University of Minnesota Hospitals in past years.

The criteria for correct and honest evaluation of the statistical results of survival rates demands the inclusion of all cases of the disease referred for treatment. And it does not allow for the exclusion of any cases which either lack follow-up methodology or are inadequately treated.

A patient from whom reply is not obtained on persistent follow-up correspondence must be considered as dead and will thus lower the percentage survival figures. For further accuracy in evaluating a given set of cases, histological proof of the diagnosis is necessary.

A rigid discipline in evaluating the results of therapy in any disease, no matter what the method of therapy, may provide a critical appraisal of the efficacy of the therapeutic method and may also provide a means of comparison of the relative merits between various types of treatment. In this way the investigator can compare his results with those of other workers in the field. If he finds his results inferior to those of his colleagues he is inspired to improve them and if he finds them superior he will publish the figures with pride in hope of inspiring others to emulate him. It should be stressed that one must study the data critically before complete acceptance of the conclusions.

Statistical results can be colored in three ways: (1) by selection of cases for therapy with exclusion of the most far advanced cases; (2) by exclusion of those cases in which follow-up study could not be completed; and (3) by reporting adenomas and benign polypi as adenocarcinoma, Grade I.

An excellent example of a proper procedure for therapeutic evaluation is in the criteria established by the League of Nations Committee for the reporting and staging of cases of carcinoma of the cervix. Institutions reporting their results under these criteria will find an effective means of comparing the results of their methods with those of other institutions.

Any physician, working in a large tumor clinic or radiation therapy department, is immediately impressed with the number of patients who come for treatment in a condition classified as hopeless, or who may rapidly progress to such a state, and for whom any treatment must be considered palliative.

We have summarized the last one hundred cases of 1949 referred to the Radiation Therapy Department for deep x-ray therapy and have classified them broadly as to the type of lesion treated and have subdivided those cases of malignant lesions into two main groups:

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*From the Department of Radiology and Physical Therapy of the University of Minnesota and the University Hospitals, Minneapolis, Minnesota.

1. Those in which curative therapy was thought possible.
2. Those in which palliative effect alone was expected. (Table I.)

Thus we can see the greatest part of our effort in the Radiation Therapy Department is treating patients with malignancy for whom palliative results can be expected at best. In the past, little has been written on this important phase of our work.

TABLE I

Classification of Last 100 Cases in 1949 Referred for Deep Roentgen Therapy

Benign Lesions:	
Peritendinitis calcarea	7
Ankylosing spondylitis	2
Retinitis proliferans	1
Paget's disease of bone	1
Osteoarthritis	8
Tuberculosis adenitis	2
Acute parotitis	1
Tenosynovitis	1
Lymphoid hyperplasia of pharynx	4
Acromegaly	1
Pituitary tumor—chromophobe adenoma	1
Total	29
Malignant Lesions (*Curative* attempt):	
Carcinoma of cervix	11
Adenocarcinoma of ovary—postoperative	1
Adenocarcinoma of endometrium	2
Carcinoma of vagina	1
Carcinoma of alveolar ridge	1
Carcinoma of sinuses and nasopharynx	3
Carcinoma of larynx—extrinsic	1
Postoperative carcinoma of breast	5
Reticulum cell sarcoma, 3rd lumbar vertebra	1
Wilm's tumor of kidney	1
Total	27
Malignant Lesions (*Palliative* attempt):	
Squamous cell carcinoma of cervix—recurrent	2
Carcinoma of breast, metastatic and recurrent	10
Pontine tumor, unclassified	1
Tumor III ventricle, unclassified	1
Carcinoma of submaxillary gland, recurrent	1
Carcinoma of antrum with extension to orbit	1
Sarcoma of mastoid	1
Transitional cell carcinoma of nasopharynx with metastases	1
Squamous cell carcinoma, left alveolar ridge, recurrent	1
Squamous cell carcinoma of lower lip and mandible	1
Carcinoma of thyroid with metastases	1
Carcinoma of larynx—extrinsic and with metastases	1
Carcinoma of lung—inoperable	1
Metastatic carcinoma, primary unknown	3
Osteogenic sarcoma (?) mandible	1
Sarcoma—undifferentiated—soft tissue	1
Hypernephroma with metastases	1
Carcinoma of rectum—recurrent	2
Hodgkin's disease	4
Lymphosarcoma	4
Lymphoblastoma—unclassified	3
Chronic lymphatic leukemia	2
Total	44

An explanation for the paucity of reports in this important field is obvious. It is difficult to marshall data and facts to present in support of one's beliefs. Certainly survival rates give no indication of the true value of the effort.

By what other criteria can we judge our efforts?

By reduction in size of the tumor: That result *alone* would be to no avail. The immediate satisfaction to the physician and patient to see the tumor reduced in size would give way to despair as the tumor would again expand. An expression of results such as centimeters decrease in size could be colored easily by the use of an "elastic rule." Decrease in size of the tumor alone is the basis by which the cancer paste quacks can mulct the public.

By increase in the length of life of the patient: To extend questionably the life of a patient with terminal malignant disease confined hopelessly to bed, with marked pain and suffering and a burden to himself and family is certainly not the aim of our effort.

It is in the relief of pain and bodily distress, the ability of the patient to remain ambulatory and to care for himself, and the continuation of a relatively comfortable, pleasant existence that we will obtain the most satisfactory result we can hope for our labor.

In March, 1947, Professor D. W. Smithers of the Royal Cancer Hospital of London in a Presidential address to the British Institute of Radiology urged the adoption of the term "Symptom-Free Rates." Recently Dr. George Pack at a tumor conference at this hospital also suggested the more extensive use of this term and the evaluation of therapeutic results in this manner. Certainly Dr. Wangensteen and the members of his department have emphasized the necessity for evaluation of the palliative results of gastric resection in cases of carcinoma of the stomach in those patients previously considered by others, as inoperable. The surgeons believe they add fifteen months of relatively painless existence to those patients in which the resection can be accomplished, and five-year survival rates alone as a method of evaluating the results of treatment in this group would give a hopeless and a superficial view of the results accomplished.

Patients are referred to us for roentgen therapy of malignant disease from most services in the hospital. It is rather infrequent that the request for therapy is rejected. These rejected cases, it is understood, fall into that large group referred for palliative effect. The thought promoting the referral is usually as follows: "The case is obviously hopeless; nothing can be done (meaning the surgeon cannot and has refused to excise the lesion); so let us give him a few x-ray treatments." Another parallel line of thought is more frequently seen in small general hospitals when the surgeon does not feel confident of the efficacy of his operation and will advise the radiologist that he removed a uterus with a tumor but he may not have excised all the tumor in the organ, and therefore, the patient should receive a little x-ray to take care of the little bit of tumor left. The fallacy of such reasoning is obvious.

There are certain definite indications and contraindications governing the use of such an important, beneficial weapon as radiation therapy, even in palliation, and there are definite dangers in its indiscriminate use.

The prime indication for palliative irradiation therapy is expected benefit to the patient by relief of pain together with extension of life and decrease in size of the lesion. The radiosensitivity of the tumor is a factor in the favorable palliative effect. It must be borne in mind that radiosensitivity is a relative and variable factor and usually allows the response to occur with a relatively lower quantity of irradiation, but the tumor may frequently recur if adequate dose is not administered.

When an adequate palliative dose is administered to a patient who seems to be in a hopeless condition it happens occasionally that complete eradication of the tumor results with recovery of the patient. An example of such experience is as follows:

Case 1. Mr. J. V., a 78-year-old, retired farmer, now in a state hospital, with marked cardiovascular disease presented himself with a large carcinoma of the palm of the left hand, but with no epitrochlear or axillary metastases. In such lesions amputation of the hand would be the choice of curative therapy. Because of his advanced age and heart disease, a palliative dose of 3500 r of superficial roentgen therapy was administered with eradication of the tumor. The usual cancericidal dose would have been 4500 to 5000 r. It seemed probable that the larger dose would have resulted in a permanent ulcer. One year later the tumor had not recurred.

The explanation of the phenomenon is as follows: The cure rate of tumors as correlated to dosage is not a fixed value. Generalizing, a rough curve can be drawn demonstrating that with a certain small dose of radiation a low percentage of cures can result. As one increases the dose the percentage of survivals will increase to a certain point where further increase in dose will result in slight or no increase in survival rate. If the dose is increased too greatly the survival rate will decrease because of severe irreparable damage to the bed of the tumor and failure of healing. The optimal dose is, of course, that range in which the survival rate curve has leveled and does not increase further (Figure 1).

In contrast to the beneficial effects of palliation one must balance the morbidity resulting from the treatment. Radiation sickness is a hazard some patients must tolerate to get the benefits. It is seldom so severe as to completely interfere with the schedule of treatments. The malady ends soon after the cessation of treatment. Numerous drugs have been used with each drug benefiting some patients, but a large percentage will not respond to any treatment for the radiation sickness.

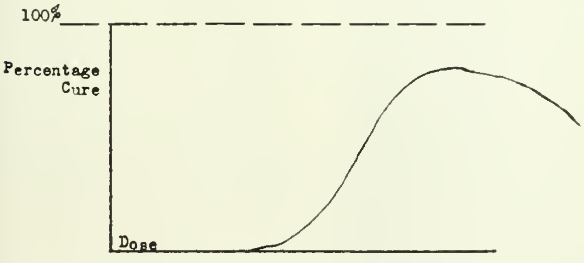

Fig. 1. The probable expression of the relationship between radiation dose and cure rate for one species of tumor.

The patient must be closely observed for development of leukopenia and anemia and these can be controlled with transfusions and prolongation of the interval of treatment, guided by the daily blood counts. Concomitant infection of the tumor may be worsened with the therapy, and should be closely observed. Frequently decrease of the dose early in the course of therapy may improve infection.

Uremia is another complication in patients with extensive malignant disease which may be aggravated during roentgen therapy, especially at the onset of the course of treatment.

The most severe morbidity is suffered by those patients who are treated for lesions about the neck. If an adequate dose of radiation is given the skin, reaction with reddening and occasional blistering reaching its peak at about the twenty-eighth day from the onset of treatment is extremely uncomfortable. The associated mucositis and pain on swallowing is most disturbing to the patient, but with supportive treatment the course of radiation is tolerated and the untoward effects are improved in about two weeks following the height of the reaction.

A danger exists in the treatment of cachectic patients whose general condition is deteriorating so rapidly that the radiation sickness associated with the therapy may further contribute to the downhill course and even on cessation of the treatments the untoward effects of the radiation may continue and aid in the patient's demise. This principle can be compared to the surgical risk in a debilitated patient and should be considered in planning the therapy.

The dose of radiation in palliation should not be too great so as to cause persistent skin ulcers, radionecrosis of bone and resulting osteomyelitis as may occur in the mandible, or severe large areas of radiation chondritis. If our aim in palliation is to insure comfort to the patient a draining, painful radiation ulcer would, for example, defeat our purpose.

We must also bear in mind that in many patients in whom curative attempt by radiation or surgery is unsuccessful, palliation may have been accomplished. Let me again cite the case of gastric cancer resection as an example of this principle.

Another illustration of this point can be gained in cases of carcinoma of the cervix, stages III and IV treated with radiation. Decidedly fewer cures are obtained in these advanced stages than in stages I and II. These patients are all treated with a resulting cure rate of 29.5 per cent in stage III, 6 per cent in stage IV, as compared to 80 per cent in stage I and 54 per cent in stage II. However, the palliative effects in the advanced stages is not insignificant. This principle is illustrated in the following case.

Case 2. Mrs. A. B. is a 44-year-old housewife who had postcoital bleeding in 1944. Her local physician cauterized her cervix at that time apparently without biopsy. In the last half of 1949 she developed pain, weakness and swelling of the right leg. A laparotomy in her home community revealed a right pelvic mass extending to the pelvic wall. A biopsy of the mass was thought to be metastatic from the cervix previously removed by the cautery in 1944. The stage of the lesion was League of Nations Stage III or IV.

A course of 3500 r/t was delivered to the pelvis. During the course of therapy the severe pain improved and on completion of the treatment series she was ambulatory. She was still in good physical condition at the last examination, four months after therapy.

There are certain occasions in which radiation therapy has previously been used as the treatment of choice because the lesion was supposedly inoperable, and in which the curative results were poor but the palliation good. An example of this is in carcinoma of the hypopharynx or a large extrinsic carcinoma of the larynx which can not be removed by laryngectomy alone. Recently Dr. Harold Wookey of Toronto and Dr. Arnold Kremen of the University of Minnesota have perfected special surgical techniques and, with great skill, have been able to resect the hypopharynx with reconstruction of the alimentary pathway by a subcutaneous skin tube. This has necessitated removal of the larynx as well. Any new method of treatment of malignant disease which may increase the five-year cure rate over the approximately 15 per cent achieved by radiation in carcinoma of the hypopharynx is deserving of trial. Only the passage of time will tell if this surgical procedure will produce a higher cure rate. It is obvious that the palliation in this surgical procedure is decidedly inferior to that of radiation therapy, and this factor must be considered in the choice of therapeutic approach.

In this discussion of palliative radiation therapy it must be understood that we do not advocate the use of radiation therapy alone. The use of surgery has already been sufficiently stressed. Neurosurgical procedures in relief of pain, such as chordotomy, ganglionectomy, neurectomy and lobotomy are of extreme importance when the patient is in extremely great pain and no less radical procedure is available.

The adjunctive use of certain chemotherapeutic agents in widespread metastatic disease is of great importance. Unfortunately, many of these preparations such as nitrogen mustard have not proved satisfactory because of short lived response. The use of hormone therapy in palliative treatment especially of metastatic carcinoma of the breast and of the prostate is another excellent weapon.

As a general rule, patients with those neoplastic lesions which are radio-resistant receive poor palliative results.

Such lesions as chondrosarcoma, neurofibroma and melanoma show little response to radiation therapy. Occasionally an exception to the general rule may occur. Adenocarcinoma of the stomach, small intestine and colon are resistant tumors. If large metastatic and inoperable masses are present in the abdomen secondary to lesions of the bowel, it is difficult to deliver the intense

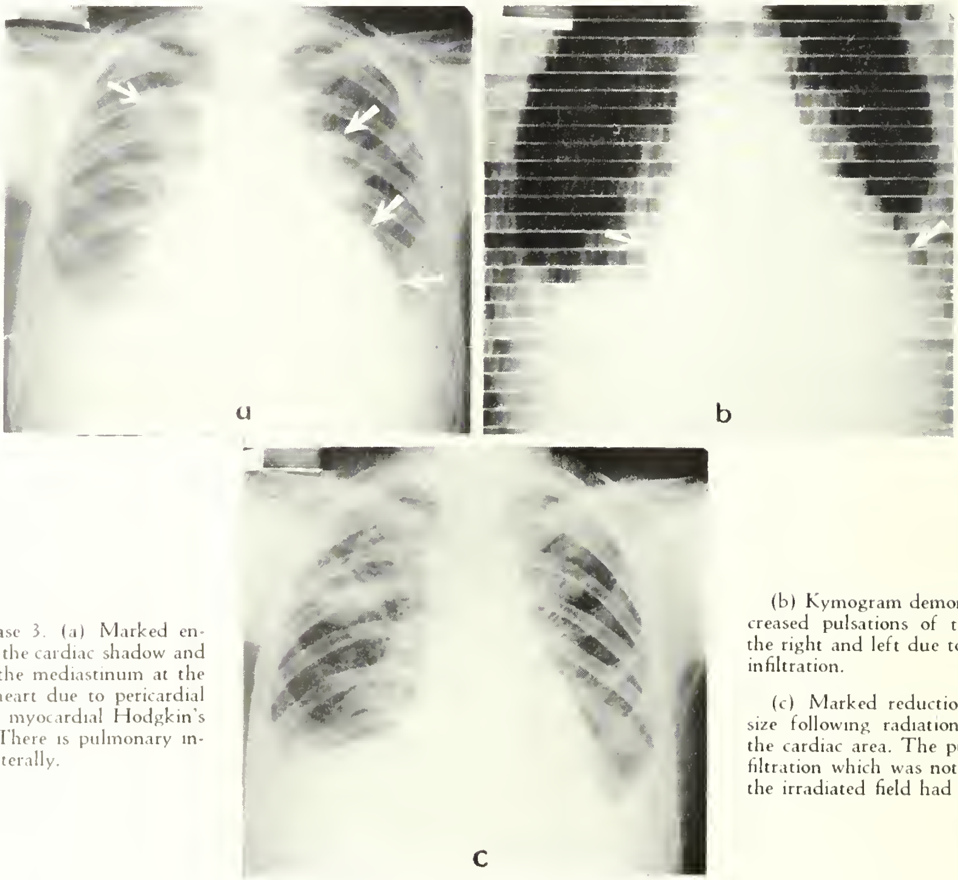

Fig. 2. Case 3. (a) Marked enlargement of the cardiac shadow and widening of the mediastinum at the base of the heart due to pericardial and probably myocardial Hodgkin's infiltration. There is pulmonary infiltration bilaterally.

(b) Kymogram demonstrating decreased pulsations of the heart on the right and left due to the cardiac infiltration.

(c) Marked reduction in cardiac size following radiation therapy to the cardiac area. The pulmonary infiltration which was not included in the irradiated field had extended.

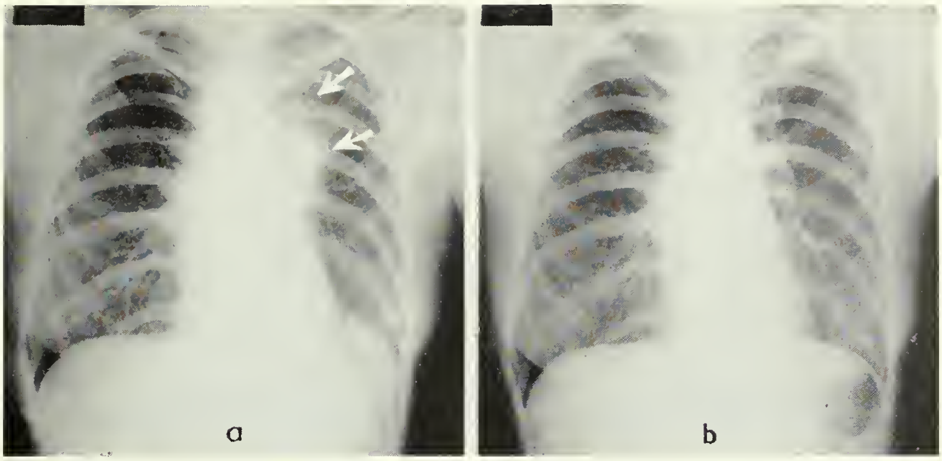

Fig. 3. Case 5. (a) Left hilar mass with atelectasis of the left upper lobe due to apparent metastatic squamous cell carcinoma with obstruction of the left upper lobe bronchus.

(b) Reduction of mass and re-expansion of the left lung following radiation therapy. Some residual fibrosis remains.

dose necessary for any response. The morbidity concomitant to the delivery of the irradiation in the large abdominal fields necessary would negate the possible benefits. However, it must be borne in mind if local distal metastases of an adenocarcinoma exist in an area where a moderate x-ray dose may be administered without undue morbidity, palliation might be obtained.

In contrast to this relative resistance of carcinoma of the colon, a carcinoma of the rectum will respond fairly well to palliative therapy.

Local recurrences so frequently seen after surgical resection of rectal carcinoma are apt to shrink after irradiation and the patient will be greatly relieved of pain.

A number of conditions in which radiation therapy is a palliative tool can be seen in Figure 1. It would be beyond the scope of this presentation to discuss more than a few of these conditions.

Lymphoblastoma, Such as Hodgkin's Disease

This group of tumors are unusually radiosensitive.

Case 3. Mr. J. D., age 20, developed back pain and progressive weakness in his legs early in 1946. By September, 1946, on admission to the University Hospitals, he had complete paralysis of lower extremities and loss of sensation from T-5 caudad. On September 12, 1946, a bilateral laminectomy of T-1 to T-4 was done with subtotal removal of neoplastic tissue from the spinal canal. Histological examination demonstrated this to be extradural infiltration of Hodgkin's disease. The operative procedure was followed by a course of x-ray therapy (1600 r in air to the upper thoracic spine in ten days), and the combined treatment resulted in perfect return of function and return of the patient to work on the farm.

In June, 1947, he received a course of x-ray therapy to enlarged cervical nodes bilaterally.

In June, 1949, he received a course of treatment to a large mass involving the sternum and the anterior mediastinum with good response. Following this he developed dyspnea, weakness, edema, progressing to marked anasarca, cyanosis, and marked distention of the great vessels of the neck. Roentgen examination revealed marked irregular enlargement of the cardiac shadow due to myocardial and pericardial lymphoblastomatous infiltration (Figure 2a). Roentgenogram and fluoroscopy revealed diminished cardiac pulsations (Figure 2b).

Roentgen therapy directed to the heart and mediastinum from September 9, 1949, to September 29, 1949, resulted in marked improvement of all symptoms and findings. Roentgenograms demonstrated marked reduction in cardiac and mediastinal infiltration (Figure 2c). The patient returned to the farm. He was last seen on February 19, 1950, and has pulmonary infiltration which was present previously.

The following case is exceptional and does not represent the average result. It is included to illustrate what occasionally may be accomplished.

Case 4. Mr. K. K., a 29-year-old male was first admitted to the University Hospitals on January 16, 1937, with a history of pain in the back for six months and progressive weakness and paraesthesis of the lower extremities. Moderate paralysis of the lower extremities was found on admission. A spinogram with lipiodol demonstrated an obstruction to the flow of the oil at the level of T-3. Widening of the superior mediastinum was also present.

Laminectomy was performed on January 22, 1937, with subtotal removal of neoplastic tissue which was demonstrated to be Hodgkin's disease on histological study. The patient received a course of deep x-ray therapy to the spine and to the chest. A total of approximately 1500 r in air was given to both the anterior chest and to the posterior chest and spine. Immediate and full recovery of the paraplegia resulted.

In May, 1937, a paraumbilical palpable mass was treated with excellent response. In September, 1937, because of dyspnea, he was given a course of x-ray therapy to enlarged mediastinal nodes. In September, 1938, he had treatment for inguinal nodes and in 1939 for axillary nodes.

He had no new manifestations for the next three years. The left eustachian tube then became occluded by Hodgkin's growth and was treated in June, 1942. Treatment was then administered in 1943 and in 1944 for other recurrences. Another period of three years elapsed before further treatment was necessary to the thorax in 1947 and to the lower abdomen for iliac node involvement in 1948.

In June, 1949, he received treatment to the right hip area for Hodgkin's infiltration of the ilium and upper femur.

All courses of therapy gave excellent results. During the entire period of treatment the patient was able to carry on a productive occupation as an insurance salesman to support his family.

Discussion. In treatment of Hodgkin's disease and other forms of the lymphoblastomata, such as lymphosarcoma and enlarged nodes of aleukemic leukemia, our aim is to give a moderate dose of between 1000 r in tissue to 2000 r in tissue to the involved areas in fourteen days. Experience has shown that the nodes in the areas treated will not expand immediately. This is in contrast to the "hit and run" method advocated by many wherein a few hundred roentgens are given to hold the nodes in "check."

SQUAMOUS CELL CARCINOMA

Squamous cell carcinoma usually responds to roentgen therapy well enough so that palliation may be obtained independently of the location. The following case is an example.

Case 5. Mrs. G. U., a 37-year-old housewife noted a mass in the left supraclavicular area in June, 1947. A node was removed in November, 1947, and was demonstrated to be a squamous cell carcinoma. A primary lesion could not be found on diligent search. A laparotomy was performed elsewhere in November, 1947, with removal of ovaries and tubes.

Deep x-ray therapy and radon implantation to left cervical and supraclavicular areas eradicated the tumor. In July, 1948, she received successful radiation to a mass in the upper mediastinum and to the sternal area. Bronchoscopy in search for a primary lesion was negative as well.

In September, 1949, because of cough, roentgen examination of the chest revealed a mass in the left hilum and atelectasis of the right upper lobe (Figure 3a). A course of therapy to the lesion resulted in obliteration of the mass and re-expansion of the left upper lobe with complete improvement of symptoms (Figure 3b). Later in January, 1950, she developed a mass in the liver demonstrated at laparotomy for which she is now receiving x-ray therapy.

CARCINOMA OF THE BREAST

The importance of radiation therapy in metastatic carcinoma of the breast is well established. Its prime use is in osteolytic bone lesions, especially in weight bearing areas such as the femora, pelvis and spine. The bone pain is, as a rule, immediately improved and there is frequently filling in of the destructive area with new bone. Pathological fractures can be avoided in this manner and these patients can be kept ambulatory and free of pain, thus satisfying our aim in palliation. Pleural effusion due to pleural and pulmonary parenchymal metastases can be controlled by irradiation as well as the mediastinal masses causing dyspnea and severe cough. Skin metastases and local recurrences are treated with adequate results. The aim of the treatment always is to keep the patient free of pain, ambulatory and capable of self care.

The development of hormonal therapy plays an equally important role in this function. Their value is especially

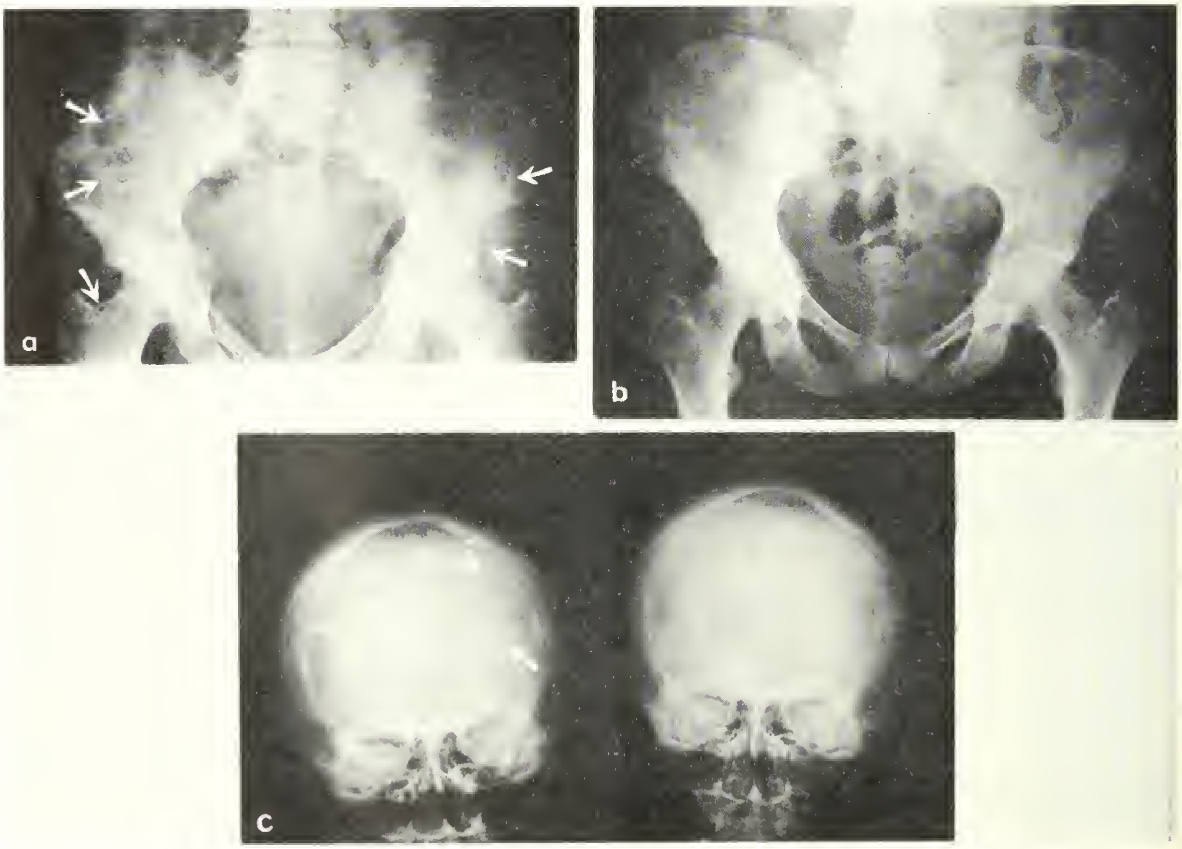

Fig. 4. Case 6. (a) Multiple extensive osteolytic metastatic carcinomatous lesions secondary to the breast in the right ilium, acetabulum and neck of the femur. The left ilium is involved to a lesser degree.

(b) The areas of osteolytic destruction have been filled in with new bone following a dose of 800 tissue roentgens delivered to the pelvis for x-ray sterilization as a method of hormonal therapy.

(c) Multiple osteolytic metastases to the skull (left) have also disappeared (right) following the radiation sterilization.

marked in cases with widespread extent of the metastases. With successful results of steroid therapy the extent of radiation necessary is decreased and the steroids are more easily administered than irradiation, and decidedly less costly. Ovarian irradiation is a practical method of accomplishing sterilization as an adjunct in therapy through hormonal effect.

Case 6. Mrs. E. W., a 42-year-old housewife was first seen at the University Hospitals on September 28, 1949. She was eight and one-half months pregnant and had severe pain in the right hip. A hard, three-centimer mass was fixed to the skin of the right breast with a large node in the right axilla. Roentgenograms revealed multiple osteoblastic and osteoclastic metastases of the pelvic bones (Figure 4a), right femur, lumbar spine, thoracic spine, ribs and skull. On September 30, 1949, she delivered her infant. Between October 5 and October 11, 1949, she received irradiation to the pelvis and lumbar spine which was computed to be 800 r in tissue to the center of the pelvis. This was followed by marked improvement in pain; the patient became ambulatory, showed complete disappearance of the palpable breast mass, axillary nodes and marked improvement in the roentgen appearance of the bone lesions (Figure 4b and 4c).

The remarkable palliative response in this case was produced by the hormonal effect secondary to the x-ray sterilization.

It has become the trend or medical fashion today to treat neoplastic disease in tumor clinics. This has been an important advance in pooling knowledge and providing for choice of the best treatment for the varied types of tumors. The patients at times do not appreciate this team work. Many are frequently confused by the multiplicity of doctors and the constant change of doctors seeing them at different visits to the clinic.

Excluding those patients who are inveterate visitors at the out-patient department the experience at the various clinics, services and laboratories is frightening to many even though they expect new and marvelous scientific achievement promised them here by their referring physician. When they arrive at the Radiation Therapy Department and possibly when admitted to the surgical ward for definitive treatment they look for hope and encouragement. When they are seen at the Tumor Clinic the question of whether they should be told they have cancer or not has previously been settled. Most patients know of their condition. From that point on peace of mind which is a most important feature of our goal of palliation "continuation of a relatively comfortable and pleasant existence" can only be achieved if they are led to believe that there is some faint hope for continued life ahead. Depriving them of any hope is an inconsiderate procedure and although the patient may be relatively free of pain, ambulatory and capable of caring for himself, he may be so mentally depressed that his remaining time may be as great a burden to himself and his family as if he were completely bedridden and in great pain.

X-ray therapy should not be used as psychotherapy; however, a little psychotherapy administered in conjunction with the x-ray in hopeless malignant disease is a great aid.

It should be stressed to the clinician that before palliative radiation therapy is promised to the patient, the radiologist should be consulted to express his opinion as to the efficacy of the treatment in each particular case.

Summary

There are definite indications for the use of palliative radiation therapy in malignant disease. The method should be utilized in those cases in which relief of pain, enhanced physical comfort, and ambulation with ability for self care can be expected. The possibility of use of other palliative agents such as chemotherapy and hormone therapy should be considered at the time of referral. The radiation therapist ought to be consulted before a decision is made and before the therapy is chosen.

The few contraindications in the use of radiation as a palliative measure have been discussed.

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RETURN OF THE COUNTRY DOCTOR

"*. . . . the country doctor is coming back. It is possible now to discern the beginnings of a trend much like the population trend of recent years which has seen more and more people moving away from the centers of large cities and into the suburbs. General practitioners are beginning to find that small towns are happy to supply x-ray and other needed equipment which previously has been available only in the big city. Good roads and better distribution of hospitals are making it possible for many more doctors to move out into the country.*—From an address *The Nation's Health*, by Admiral William H. P. Blandy, U.S.N. (Ret.)

The Diagnosis and Treatment of Hyperthyroidism*

William A. Stafne, M.D., Lester E. Wold, M.D., and Albert C. Kohlmeyer, M.D.†
Fargo, North Dakota

UNTIL a decade ago the treatment of hyperthyroidism, whether associated with a diffuse or an adenomatous goiter had been fairly well standardized. Universally good clinical results were obtained by subtotal surgical resection after preparation with iodine. While the introduction of antithyroid drugs and radioactive iodine has complicated the management of hyperthyroidism, it has broadened our knowledge of normal and pathological thyroid function. It would seem desirable to review briefly the normal physiology of the thyroid gland in the light of this knowledge, before touching briefly on some hints in diagnosis, and discussing methods of treatment available to the general practitioner.

THYROID PHYSIOLOGY IN RELATION TO THERAPY

The thyroid gland is unique in that it is the only endocrine gland in the body which secretes a hormone, stores it outside the cells and releases it into the circulation as required. The secretory unit of the gland is the follicle, the cells of which manufacture the hormone thyroxine and store it within the lumen of the follicle as a protein bound substance—thyroglobulin. The homogeneous eosinophilic substance which fills the follicle is called colloid; it has a protein nature, contains iodine, and is probably stored thyroglobulin. Kendall [1] was the first to extract a pure crystalline hormone from the thyroid and to this substance he gave the name thyroxine. Harrington [2] subsequently demonstrated that Kendall's crystalline material is an amino-acid, namely tyrosine containing four atoms of iodine. Thus it is seen that the raw materials for the manufacture of the thyroxine are the amino-acid tyrosine, and iodine.

Pituitary-thyroid axis. One of the important concepts of thyroid gland physiology is its hormonal relationship to the anterior lobe of the pituitary gland. Figure 1 shows this relationship diagramatically. The arrow from the pituitary to the thyroid gland indicates the stimulating action of the thyroid stimulating hormone, designated T.S.H. The anterior pituitary gland thus stimulates the thyroid to secrete thyroxine. The arrow from the thyroid to the pituitary gland indicates the inhibiting action of thyroxine on the output of T.S.H. Thus a balance is maintained whereby each gland tends to control or regulate the hormonal output of the other. If for example, the output of thyroxine is decreased, due to primary disease of the thyroid or following the administration of an antithyroid drug, then the inhibiting action of thyroxine on T.S.H. is diminished and an increased output of T.S.H. will occur.

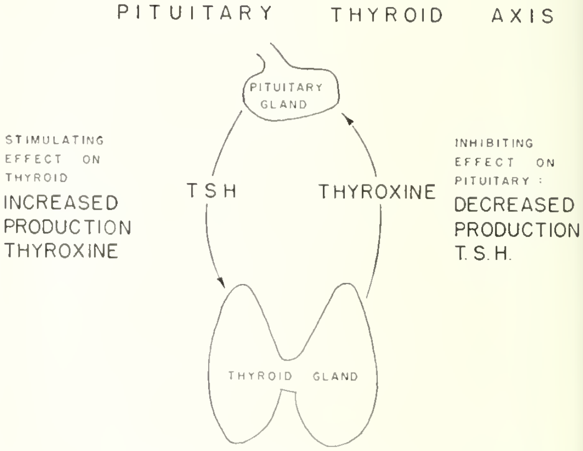
PITUITARY THYROID AXIS
PITUITARY GLAND
STIMULATING EFFECT ON THYROID
INCREASED PRODUCTION THYROXINE
T S H
THYROXINE
INHIBITING EFFECT ON PITUITARY :
DECREASED PRODUCTION T. S. H.
THYROID GLAND

Fig. 1. Pituitary-thyroid axis.

Formation of thyroxine. Figure 2 gives us a diagrammatic representation of thyroid-hormone synthesis and delivery. The thyroid cell picks up iodide where it is acted upon by the peroxidase enzyme system in the presence of manganese and oxygen to liberate free iodine. It also, presumably, picks up amino acids, including tyrosine, which combines immediately with iodine to form diiodotyrosine and subsequently two molecules of diiodotyrosine are condensed to form one of thyroglobulin. Proteolytic enzymes break up the thyroglobulin to smaller thyroxine molecules and the thyroid hormone is released into the circulation.

Action of antithyroid drugs. The thiourea derivatives exert their therapeutic effect by blocking the formation

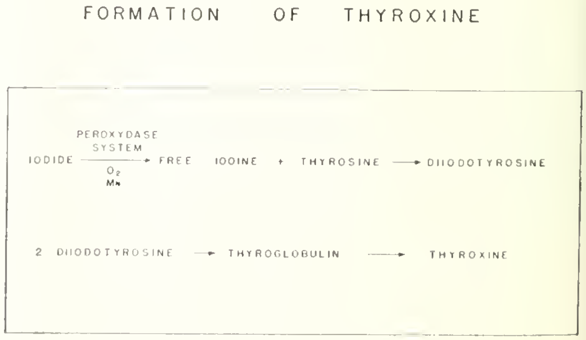

Fig. 2. Formation of thyroxine.

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Presented at the North Dakota State Medical Meeting, Grand Forks, North Dakota, May 30, 1950.

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of free iodine from iodide. Consequently no iodine is available for combination with tyrosine to form diiodotyrosine and eventually thyroxine. However, decreasing the blood thyroxine level lessens the inhibiting action of the thyroid hormone on the pituitary gland. Consequently more T.S.H. is formed. This effects an increased vascularity and hyperplasia even in the face of clinical improvement. Early in our use of the antithyroids this paradox led to many technical difficulties for the surgeon. The use of iodine preoperatively has for the most part eliminated this.

Iodine. Although iodine has been used for years in the treatment of hyperthyroidism its mode of action had not been clarified until very recently. Its first action is the inactivation of T.S.H.—decreasing the amount of available T.S.H. to stimulate thyroid tissue.[3] Hence with a decrease of this stimulus the thyroid gland tends to revert to a resting state with the morphology of an iodinated gland. Secondly, it reduces the metabolic rate by depressing the rate of action of the proteolytic enzyme[4] whose normal function is to resolve the large molecule, thyroglobulin, with a molecular weight of 700,000 into a small molecule, thyroxine, with a molecular weight of 69,000 so it may be released into the blood stream. Thus iodine not only depresses proteolytic enzyme function directly by combining with it chemically but also inactivates T.S.H. which normally controls the rate of activity of the proteolytic enzyme.

DIAGNOSIS OF HYPERTHYROIDISM

The diagnosis of severe hyperthyroidism or classic Graves' disease requires no special diagnostic acumen on the part of the physician. This is often made by the patient himself or some friend or relative before the patient comes to the doctor's office.

However, there are a few clinical manifestations which should be stressed as important in making the early diagnosis of hyperthyroidism.

We recently studied fifty consecutive cases of toxic diffuse and fifty consecutive cases of toxic nodular goiter which were admitted to St. Luke's hospital. Table I shows the symptoms encountered in this group along with the indicated frequency.

Table I.

Incidence of Various Symptoms

Symptoms	Toxic Diffuse Goiter (Per cent)	Toxic Nodular Goiter (Per cent)
Nervousness	75	70
Weight loss	70	68
Exophthalmus	62	8
Goiter	54	74
Tremor	52	34
Palpitation	50	52
Weakness	41	40
Sweats	35	18
Heat intolerance	27	16
Polyphagia	20	18
Diarrhea	12	2
Personality changes	2	4
Polydipsia	2	2

Nervous manifestations. Nervousness in toxic goiter is fairly typical, although at times it becomes quite a problem to differentiate between thyrotoxicosis and psychoneurosis. Every year we see a large number of patients coming in with a diagnosis of thyrotoxicosis who prove to have no overactivity of the thyroid at all and often are nervous women with domestic problems. In general the nervous manifestations of the disease are greater in persons with exophthalmic goiter than those with toxic adenoma. Indeed the presence or absence of emotional instability was considered by Plummer to be the most important sign in distinguishing between the two diseases.

Exophthalmus. Exophthalmus of varying degrees was noted in 62 per cent of patients with diffuse toxic goiters. It is not commonly noted in patients with nodular goiters and hyperthyroidism. In determining the degree of exophthalmus it is important to bear in mind the natural prominence of the patient's eyes before the onset of the disease. Puffiness of the eyelids is a very characteristic finding and is sometimes of more diagnostic value than exophthalmus. One eye is often more prominent than the other. A great variety of eye signs have been described but only two of them are of much practical importance, namely lid lag (von Graefe's sign) and poor convergence (Möbius sign). As the exophthalmus increases the movements of various extra-ocular muscles may be impaired, producing many abnormalities in the movements of the eyeballs. Exophthalmus may be the first sign of exophthalmic goiter and may precede the onset of an increased basal metabolism by as much as six to nine months.

Goiter. The incidence of a palpable thyroid in this series was extremely low, namely 54 per cent in the diffuse toxic and 74 per cent in the toxic nodular type. This probably reflects our difficulty in recording specific details in the history. The term exophthalmic goiter is a misnomer because the disease may be present without exophthalmus and without a goiter, although it is most unusual to observe the absence of both in the same patient. Even though the thyroid gland may not be enlarged it is usually much firmer than the normal and in patients who show very little enlargement the increased firmness may be an important diagnostic sign, particularly if it is associated with the presence of a systolic bruit over one or both of the superior poles. The bruit and thrill do not occur in the normal gland.

Cardiac manifestations. Of all the symptoms of hyperthyroidism those referable to the circulatory system are the most constant and dependable. A persistent, forceful, afebrile tachycardia of 100 or above with an increase in pulse pressure must be considered the result of hyperthyroidism until proved otherwise.[5] If the pulse rate is below 90 the chances are that the patient does not have an overactive thyroid.

Cardiac decompensation may be the first recognizable manifestation of hyperthyroidism especially in older individuals. Both transient and prolonged attacks of auricular fibrillation are not uncommon. They usually mean that the heart is independently damaged by arteriosclerosis or rheumatic fever. The number of patients in our series with auricular fibrillation was 20 per cent in the toxic nodular group and 6 per cent in the toxic diffuse group. Some of these patients had frank signs of congestive failure whereas others had had symptoms only on exertion. Needless to say it is important to carefully evaluate the cardiac status in all patients with hyperthyroidism and to institute proper treatment. There is a not uncommon misconception that when a patient with auricular fibrillation does not respond to digitalis by lowering the pulse and apical rate one should consider hyperthyroidism or some other toxic condition. While this may be true occasionally, the reverse is also true, that digitalis can slow an auricular fibrillation to a normal rate in spite of the presence of hyperthyroidism. The diagnosis is not always easy, particularly when toxic goiters occur in apathetic individuals. The nervous manifestations of the disease may then be almost absent and what few there are can only be elicited by most careful examination of the patients. It must be remembered that cardiac decompensation in itself will increase the basal metabolic rate.

Cutaneous and calorigenic manifestations. The skin of the patient with hyperthyroidism is warm and moist. This is a compensatory attempt by the body to lose some of the excessive heat that results from increased oxidation in body cells due to the hypermetabolism. The body temperature is frequently elevated above normal. The head and neck may appear quite flushed. The palms in particular are hot and moist. This is of such significance that the presence of a cold hand almost rules out hyperthyroidism. The patient desires cool weather and less clothes than normally.

Occasionally the fingernails undergo changes in which the distal end leaves the nail bed and produces a concave or irregular margin. When present, this sign is pathognomonic of hyperthyroidism.

Gastrointestinal symptoms. Diarrhea occurs in less than one-third of the cases. It is usually present in the more severe ones. Persistent nausea and vomiting are very serious symptoms in the thyrotoxic patient and should be considered strong presumptive evidence of an impending crisis.

Laboratory Tests as Diagnostic Aids

1. Basal metabolic rate.
2. Therapeutic test (Iodine.
   (Anti-thyroid drug.
3. Blood cholesterol determination.
4. Protein bound blood iodine.
5. Radioactive iodine

Most clinicians feel very definitely that the physical findings, history, clinical experience, judgment, and diagnostic ability of the physician are vastly more important than any laboratory test.

Astwood[6] has stated that the basal metabolic rate as a chief index of thyroid function probably leads to more mistakes than it does to correct diagnosis. This may be readily appreciated when one scrutinizes the numerous conditions which may produce hypermetabolism.

Conditions Producing Hypermetabolism

1. Endocrinopathy.
   a. Hyperthyroidism.
   b. Basophilic adenoma of the pituitary.
   c. Adrenal cortical tumors.
   d. Adrenal medullary tumors such as pheochromocytoma.
   e. Diabetes insipidus.
   f. Acromegaly.
2. Blood dyscrasia.
   a. Leukemia — hypermetabolism usually occurs in the chronic type paralleling the number of white blood cells. Rates as high as 70 per cent may be noted.
   b. Polycythemia.
   c. Anemia.
3. Myocardial insufficiency—the metabolism may be elevated 50 per cent.
4. Anxiety state.
5. Hypertension—increased metabolism may be as much as 30 per cent.
6. Drugs.
   a. Thyrotoxicosis factitia.
   b. Thyroxine.
   c. Caffeine—7½ gr. of caffeine sodium benzoate may raise the metabolism 25 per cent in two hours.
   d. Dinitrophenol.
   e. Ephedrine.
7. Fever.
8. Pregnancy in the second and third trimester.
9. Hemochromatosis.
10. Technical error due to loss of oxygen.
11. Punctured ear drums.

However, keeping these factors in mind the basal metabolic rate remains to date the most important guide which we, as general practitioners, have at our disposal. A single determination, particularly if there is only a moderate elevation and meager clinical evidence, should not be relied upon any more than an isolated observation of pulse, temperature or blood pressure reading. A second or third determination may drop to normal. In borderline cases the giving of small doses of sedation for a few days before repeating the test may show a perfectly normal rate. Bartels[7] has shown that the use of sodium pentothal administered intravenously during the performance of the test in psychoneurotic and anxiety state individuals has resulted in an extremely reliable rate.

In general the rate must be consistently elevated to 15 per cent or more above the normal before it can be concluded that hyperthyroidism is present. In doubtful cases a policy of watchful waiting is advocated in the event that if hyperthyroidism is truly present it will ultimately declare itself in unmistakable terms. No one need apologize for carefully observing a patient who is suspected of having hyperthyroidism. Another aid which is perhaps the most specific test is the diagnostic use of iodine. After the basal metabolic level has been determined Lugol's solution is given for a period of 10 to 14 days. Patients with hyperthyroidism almost invariably show marked improvement while those suffering from other conditions are not affected by the treatment. Propylthiouracil may be substituted for iodine but the chief objection to this is that much longer periods of time are required for the maximum effect on metabolism to appear (30 to 35 days).

Blood cholesterol in patients with hyperthyroidism is often low or in the lower levels of normal. Many observers feel that this test is unreliable since malnutrition lowers the level independent of thyroid activity. In our group the value was definitely lowered in all but one case. However, if the total cholesterol value is above 220 mg. one can say with certainty that the patient does not represent a case of hyperthyroidism.

There are now available two diagnostic aids of considerable help in equivocal cases: the determination of the protein bound iodine or "hormonal iodine" of the blood, and the determination of the urinary excretion of radio-active iodine. Unfortunately at the present time these require laboratory equipment and technical aid not generally available. It is hoped that in the not too distant future laboratories may be established at strategic locations so that patients can be conveniently cared for.

Both of these tests measure the functional state of the gland. If the protein bound iodine is elevated (normal 3.5 to 7 gamma per 100 cc.) there is strong evidence that the thyroid gland is overactive. If after giving a patient a tracer dose of radio-active iodine and less than 40 per cent is excreted in the urine at the end of 48 hours it is assumed that most of it was trapped by the thyroid and that the gland is hyperactive.

Treatment

There is currently considerable confusion regarding the treatment of hyperthyroidism. In perusing the literature one is easily able to get support for any one of the various methods now employed in its treatment: (1) surgery; (2) roentgen therapy; (3) radio-iodine; (4) iodine; and (5) anti-thyroid medication.

The conclusions reached by various authors, although different, are no doubt honestly obtained and depend on several factors: on the section of the country, the type of goiter prevalent in that section, the type of practice engaged in (medical, surgical, private, or group), as well as the particular experience of the investigator. For example, one could hardly be critical of Astwood's enthusiasm for the medical management of hyperthyroidism after all of his original work with the goitrogens.

Because of this confusion we thought it worthwhile to study the 100 consecutive cases of hyperthyroidism already referred to in an attempt to evaluate the treatment of the type of goiter we see in North Dakota, in the light of the therapeutic facilities which we have at our disposal.

Surgery. All but three of the patients in this series had subtotal resection of the thyroid gland as part of the treatment for their hyperthyroidism. In other instances goitrogenic drugs were used initially in an attempt toward total treatment. In each instance surgery was resorted to because of recurrence of hyperthyroidism coincident with cessation of continuous anti-thyroid medication. We admit that our experience is not large and do not wish to be interpreted as being opposed to total treatment with the goitrogens. Actually we do have, at present, several patients with hyperthyroidism who are receiving goitrogenic drugs but because they were not hospitalized are not included in this series.

X-ray. One patient with severe hyperthyroidism received local roentgen therapy to the thyroid gland because of her refusal to submit to surgery. The results were favorable. Today, with the availability of radio-iodine and the goitrogenic drugs, we feel there is little indication for roentgen therapy to the thyroid gland. One patient with severe exophthalmus and mild hyperthyroidism had roentgen therapy to the pituitary gland. She is at present being treated with iodine and dessicated thyroid. She is getting along well with both her exophthalmus and hyperthyroidism under control. We believe there is a definite indication for such therapy.

Radio-iodine. One patient with severe exophthalmus and slight hyperthyroidism was treated with radio-iodine elsewhere. There are many who feel that surgery has no advantages over radio-iodine. The main disadvantage to I^{131} is the rather frequent occurrence of myxedema. It could reasonably be expected that with more experience in dosage calculation the occurrence of this complication will be reduced materially.

Disadvantages cited for North Dakota should include, of course, the non-availability of the radioactive material, but it is reasonable to expect that in the not too distant future this type of treatment will be available. The technique is relatively simple, with none of the dangers or discomforts of surgery. Mortality is zero, and there is no injury to the recurrent laryngeal nerve or parathyroid glands.

The carcinogenic properties of I^{131} are not fully understood. To us this would represent one of the principal contraindications to its use in the treatment of hyperthyroidism.

Iodine. Iodine is employed in the form of Lugol's solution to prepare the mildly thyrotoxic patient for surgery. The rapidity of the preparation (it takes only two to three weeks for adequate preparation of the patient with mild hyperthyroidism), and the almost complete absence of complications are both reasons why Lugol's is employed. It should be used for both diffuse and nodular goiter. Patients with adenomatous goiter with hyperthyroidism respond to iodine preparation less dramatically, but 10 per cent of clinically diagnosed nodular goiters exist in hyperplastic glands and this is an added reason for employing Lugol's in the preparation of the patient with adenomatous goiter who has mild hyperthyroidism. There is no substitute for iodine in the treatment of crisis and it may be life saving.

Iodine may be given occasionally in the prolonged treatment of mild hyperthyroidism with a small gland. Iodine is used also in conjunction with the goitrogens preoperatively to cut down on the vascularity and friability of the gland and to make the surgical procedure less difficult technically. Iodine may be withheld until two to three weeks prior to surgery; it may be given concurrently with the anti-thyroid drugs; or it may be initiated when the basal metabolic rate reaches +20. In our experience the surgeon is apt to encounter some increased vascularity regardless of the plan used. The use of iodine in this fashion does, however, improve the situation remarkably. The goitrogens are stopped one week prior to surgery in an attempt to avoid any toxic reactions in the immediate postoperative period.

ANTI-THYROID

Although treatment with goitrogens takes longer, there is no question but that it is possible to lower basal metabolic rates to more favorable preoperative levels by this method than by preoperative preparation with iodine. For this reason goitrogenic drugs are used in the preoperative preparation of all highly toxic patients. It is generally accepted that crisis can be avoided by rendering the patient euthyroid at the time of surgery. In both the patient with exophthalmus and the patient with adenomatous goiter who is highly toxic this state can more closely be approached with the goitrogens than with iodine alone.

The goitrogens may also be employed in the *total* treatment of hyperthyroidism. We feel these drugs should be employed in this manner in cases of recurrent exophthalmic goiter, where patient or surgeon decides against reoperation. We feel the incidence of carcinoma in nodular goiter to be significant enough to demand surgery in preference to medical therapy. Older patients, those over age 50, should be prepared with anti-thyroid drugs because of the greater surgical mortality in this age group.

There is a small group of patients with hyperthyroidism who because of co-existing cardiac or other disease represent prohibitive operative risks. These patients are best managed by goitrogenic drugs. Our experience is small but it has always been that not too long after discontinuing the drug the hyperthyroidism has returned.

Both the type of goiter and previous treatment affect the clinical response from propyl-thiouracil or other anti-thyroid drugs. Patients with large or nodular goiters or patients who have recently been treated with iodine exhibit a slow response. Three hundred mgm. of propyl-thiouracil a day will control 96 per cent of patients with hyperthyroidism. If there is no evident clinical response after three or four weeks on this dosage, the drug should be given in amounts of from 400 to 600 mgm. a day.

Toxic reactions may be expected in two per cent of patients receiving propyl-thiouracil. There has been one death reported in the medical literature[8] as due to this drug. We believe frequent blood tests are unnecessary but the patient should be alerted to all manifestations of toxicity. It is wise to make a white blood count before therapy is initiated as neutropenia is often present in hyperthyroidism. If the neutrophiles fall to 20 per cent or below the drug must be discontinued.

PROGRESSIVE EXOPHTHALMUS

If the signs or symptoms of exophthalmus precede the signs or symptoms of hyperthyroidism, surgery or anti-thyroid drugs should be avoided because they aggravate exophthalmus. Such patients are best treated with iodine and dessicated thyroid alone or in conjunction with roentgen therapy to the pituitary.

CONCLUSIONS

1. Thyroid physiology and its relation to present-day treatment of hyperthyroidism has been reviewed.

2. The diagnosis and treatment of hyperthyroidism has been discussed.

3. The decision as to the proper type of treatment in any given case of hyperthyroidism will depend on several factors:

(a) The type of goiter encountered.
(b) The particular experience of the physician.
(c) The cooperation of the patient.
(d) The facilities available.

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The desire to take medicine is perhaps the greatest feature which distinguishes man from animals.—WILLIAM OSLER, M.D.

The Mayo Memorial as it will appear on completion in 1952.

The Mayo Memorial

Address at the ground-breaking ceremony for the Mayo Memorial
University of Minnesota, July 5, 1950

Donald J. Cowling, Ph.D.[*]
St. Paul, Minnesota

The Committee of Founders of the Mayo Memorial was created by the Legislature of Minnesota in April, 1943, upon the initiative of Governor Stassen. The resolution creating the Committee gave public expression to the State's appreciation of the character and services of the Doctors Mayo in the following language: "The Doctors Mayo, William J. and Charles H., were two great humanitarians who brought to mankind many outstanding advances in medical science. We were proud to have them as citizens of our state while their works and their influence knew no bounds; they brought enduring fame to the State of Minnesota and substantial assistance and inspiration to the University of Minnesota."

The act passed by the Legislature specified that three members of the Committee be appointed by the House of Representatives, three by the Senate and that the Governor be requested to appoint such additional members as might seem desirable. He appointed twelve, thus increasing the total membership to eighteen. The Committee was authorized to arrange for a suitable Memorial to the Doctors Mayo and to secure the necessary funds.

During the following months many suggestions as to the type and location of the proposed Memorial were considered by individual members of the Committee. A number of informal meetings were held, including several meetings with officials of the University. No definite commitments were made and all tentative plans were subject to modification and approval by the Committee of Founders. When the Committee met for permanent organization in June, 1944, it was unanimously agreed that the Memorial should take the form of a building for medical education and research to be located on the campus of the Medical School of the University of Minnesota. It was also agreed that the ownership and management of the project should be vested in the Board of Regents of the University.

This decision as to the nature and place of the Memorial seemed especially fitting in view of the long and active interest of both of the Doctors Mayo in the University and especially in the Medical School. Dr. Will was a regent from 1907 until his death in 1939. Dr. Charlie was a professor of surgery for 20 years. In 1915 they established the Mayo Foundation for Medical Education and Research as part of the Medical School, and by June 30, 1944, their gifts to the Foundation had amounted to more than $3,000,000. In 1934, in a letter to the Board of Regents, Dr. Will wrote: "It seemed to my brother and myself that the crowning endeavor of a life in medicine would be to aid in the development of medical education and research."

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[*] Chairman of the Committee of Founders of the Mayo Memorial; president emeritus of Carleton College.

When the nature and location of the Memorial had been determined, the Committee began at once to lay plans for raising the necessary funds. At its first meeting in June, 1944, a goal of $1,500,000 was authorized. It soon became evident that this would not be enough. At meetings of the Committee in October and November, 1944, the question of increasing the amount to $2,000,000 was considered. In January, 1945, this goal was approved, and the officers of the Committee were authorized to submit to the Legislature a request for $1,000,000 on condition that an equal amount be secured "from sources other than state funds." The Legislature responded with a grant of $750,000 in April, 1945, with assurances, however, from many friends, both in the Senate and the House, that they would consider a further grant in the 1947 session.

The Committee soon found itself confronted with the whole problem of the medical school's need for greatly expanded physical facilities. It was not practical to consider the Mayo Memorial building without reference to other buildings that had been planned and to the total needs of the school. Preliminary sketches had already been made for separate buildings for the School of Public Health and for the Medical Library. The interest of many friends and of the Minnesota Division of the American Cancer Society centered in a proposed Cancer Institute. Other special interests had also developed.

In view of these circumstances, the Board of Regents, with the cooperation of the architects who had prepared the preliminary plans for the Memorial, employed a Chicago firm with wide experience in the field of hospital buildings and equipment, to review the plans for the Memorial and the other proposed buildings. The result of this study was an entirely new plan which combined the School of Public Health, the Library, and the Cancer Institute with the Memorial; arranged for an auditorium in a separate building; and provided in four additional buildings for the administration offices and for additional space for laboratories, shops, and garage. These four buildings and the auditorium would also serve to connect the Memorial with the existing medical buildings and hospitals, thus uniting the entire medical plant into a connected whole.

These plans were approved by the Regents and later by the Committee of Founders at a meeting in December, 1946. The entire project came to be known as the Mayo Memorial Medical Center. The estimated cost was about $5,000,000—$3,000,000 for the Memorial building and auditorium, and $2,000,000 more for the other buildings.

At first the Committee of Founders felt responsible only for the Memorial building and the auditorium, estimated at $3,000,000, and submitted to the Legislature a request for a second grant of $750,000, to bring its total to $1,500,000, on condition that the Committee secure an equal amount. This request was granted by the Legislature in April, 1947.

Following this second grant by the Legislature, the plans for the whole medical center were developed further, and again it became evident that the preliminary estimates were wholly inadequate. As the needs of the several departments of the medical school were studied in terms of actual plans for meeting them and as building costs kept mounting, the Committee at its meeting in December, 1947, was confronted with the necessity of securing much larger sums or cutting the whole program almost in half.

Practically the whole year of 1948 was spent exploring these possibilities. In the meantime, the Committee had decided to apply for help from federal funds which Congress had made available. By December, 1948, federal grants amounting to $1,250,000 had been promised and further grants seemed possible. However, even with this help, the fulfillment of our dreams seemed impossible unless the Legislature of Minnesota would make a further appropriation of an amount beyond anything previously hoped for.

The crucial meeting of our Committee was held on January 19, 1949. By this time it was clear that about twelve million dollars would be needed to make the Mayo Memorial Medical Center a reality. The Committee saw no possibility of securing a total of any such amount except by action of the Legislature. The Committee felt that it should not take the responsibility for cutting down the program which, in all likelihood, would leave the Medical School with inadequate facilities for generations to come. It, therefore, decided unanimously to submit to the Legislature a request for an additional $5,500,000, which would make it possible to carry out the complete program. The request was at first almost breath-taking. However, after considering the need and realizing the wholly unsatisfactory condition in which the Medical School would be left if the request were not granted, the Legislature by unanimous action of both the House and Senate authorized the additional $5,500,000, and the Bill was promptly signed by the Governor.

This brought the total granted by the Legislature to $7,000,000; Federal funds were increased to over $3,000,000 and over $2,000,000 was secured in private gifts, making a total now available of about twelve and a quarter million dollars. The entire cost of raising the funds will be more than covered by the interest received on gifts before they are used.

It is a pleasant but a very difficult task to suggest those to whom special credit should be given for their part in bringing about this happy outcome of our undertaking. One thinks first of the gift of $500,000 by the Mayo Properties Association, made soon after the appointment of our Committee. This gift was made to assist in the development of the School of Public Health, which was at first planned as a separate building. When it was decided to provide facilities for the Public Health program in the Mayo Memorial, the donors of this great gift left with the Board of Regents responsibility as to how it should be spent. The Regents finally decided that $350,000 should be used for space in the Memorial building for the Public Health program and $150,000 for its maintenance.

The Minnesota Division of the American Cancer Society undertook to raise $300,000. This was to provide additional facilities for research in cancer and was given especially in recognition of the work of Dr. Wangensteen.

In line with these important gifts should be mentioned those of the Citizens Aid Society and of Mrs. George Chase Christian, who gave her personal direction to its affairs for so many years. Early in the campaign the Society and Mrs. Christian personally made important gifts to the Mayo Memorial and later there was placed in our hands a check for $88,899.52, which was the balance remaining in the treasury of the Society after its Trustees had decided to bring to a close its long ministry to Minneapolis and the State. It is pleasant to think that at least some aspects of its work will be carried on into the long future through the Mayo Memorial.

Another gift which deserves special mention was made by Mr. Frank T. Heffelfinger and Mr. Frederick B. Wells. After previous gifts by themselves and their company, they joined in a final gift of $50,000 in memory of their father-in-law, Mr. Frank H. Peavey.

It is even more difficult to suggest those who deserve special mention because of their significant personal interest and support of the Mayo Memorial program. Dr. Diehl comes first to mind. He has lived with, and perhaps I should say, suffered with this project for nearly ten years. The planning of the buildings with the architects and the tedious task of working out the distribution of facilities has been his responsibility shared fully with other members of the medical staff. He has also been largely responsible for the gifts from the federal government. President Coffey attended most of the conferences held during his administration and aided materially in shaping the program in its early stages. Our Committee had the privilege of first introducing Dr. Morrill to a public gathering in Minnesota after his election as President of the University. His attendance at the meeting in May, 1945, and the large and representative gathering which his presence inspired gave new life to our program at a time when our spirits were low, due to the first disappointing response on the part of the Legislature. Ever since that first meeting, President Morrill's interest and support have been consistent and most encouraging.

Dr. George Earl, a graduate of the Medical School and former president of the General Alumni Association, has been Secretary of the Committee from the beginning.

The Committee was fortunate in having the professional services of Mr. Byron W. Shimp of New York for seven months from the beginning of our public campaign in January, 1945, and for three months in 1947. Mr. Shimp had successfully directed our Minnesota War Service Fund campaigns in 1943 and 1944. His thorough understanding of the problems involved in raising funds and his success in securing the cooperation of representative groups of volunteer helpers throughout the state were important factors in the initial success of our campaign. Mrs. Florence Robinson has served the Committee in the office with unusual efficiency and faithfulness and has been responsible in no small measure for the exceptional record made in collecting the amounts pledged. Of the $1,426,000 pledged by individuals and corporations, less than $6,000 now remains uncollected.

Mr. John S. Pillsbury, chairman of our National Committee; Mr. Thomas Moore and Mrs. John S. Dalrymple, co-chairmen of the Minneapolis Committee; Mr. Frederic Crosby, our chairman in St. Paul; and Dr. Tuohy in Duluth, together with literally dozens of representative citizens who served as chairmen of our county Committees, all deserve praise and gratitude for their successful efforts.

Governor Thye fully endorsed and supported our program and Governor Youngdahl has given us cordial and effective cooperation. However, the Memorial would not now be possible except for the interest which developed and the sense of responsibility on the part of members of the House and Senate of our Legislature. Senator Henry H. Sullivan, chairman of the Senate Finance Committee, and Claude Allen, chairman of the corresponding Committee in the House, were largely responsible for the unanimous action of both of these bodies in making the final grant.

The memory of what I have already referred to as the critical meeting of January 19, 1949, will always remain with me. I shall not forget the address by President Morrill, who gave us every encouragement consistent with his responsibilities to other departments of the University. Claude Allen, who had accepted membership on the Committee of Founders when a vacancy occurred, assured us that the members of the Legislature appreciated the benefits that would come to the people of the State through the Memorial and advised against any program that would mean serious curtailment of the project. Senator Gerald T. Mullin, who had been invited to this meeting as a special guest of the Committee, strongly urged us to submit a request for the full amount needed to complete the whole understaking. Archbishop Murray reinforced the position taken by Mr. Allen and Senator Mullin and himself made the motion to submit to the Legislature the request for a final grant of $5,500,000. These men all had faith and courage and without the help of any one of them our understaking might have failed.

In closing I should like to express a personal sentiment which I have had from the beginning of my connection with the Mayo Memorial. It is a sentiment of gratitude for the privilege of helping perpetuate the memory of Dr. William J. and Dr. Charles H. Mayo on this campus, and throughout the state and the nation, and beyond. This sense of high privilege has been due not primarily to the unique standing and prestige of these preeminent citizens of Minnesota, nor to their vast accomplishments in the field of medical research and practice, but to their personal commitments to a view of life which their actions embodied.

In one of his letters to the Regents, Dr. Will wrote: "Our father recognized certain definite social obligations. He believed that any man who had better opportunity than others, greater strength of mind, body, or character owed something to those who had not been so provided; that is, that the important thing in life is not

(Continued on page 407)

The Application of the Insulins in the Treatment of Diabetes Mellitus*

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In the selection of the type of insulin which may be most efficiently employed in the treatment of a diabetic patient, the speed of action and the duration of effect of the insulin to be employed are the all-important factors.

For approximately 14 years after insulin came into general use, practitioners were limited to one type of insulin, namely, regular or amorphous insulin. Then successively other types became available. Protamine zinc insulin characterized by slow, long action was introduced in 1937. Crystalline insulin (solution of insulin crystals with zinc) was the next to join the insulin family and was originally thought to be intermediate in duration of effect. Globin insulin was introduced later and proved to be more nearly an intermediate insulin. The use of mixtures of short-acting and long-acting insulins which may be "tailor-made" to meet the needs of a specific patient, within some limitations, began about five years ago. They are now most commonly employed as 2:1 mixtures, that is, two parts of quick-acting to one part of protamine zinc insulin. Finally, NPH50, a new insulin with a different timing effect, has been under study for the past two years and may become available, if approved by the Toronto Insulin Committee, during this calendar year.

The current problem is which insulin or combination of insulin should the practitioner select which will best control the diabetes in the individual patient? It is commonly stated that if the known diabetics were on an adequate diet, that approximately one-half of them would require extraneous insulin to obtain said control. Although the average dose of insulin employed by insulin-using diabetics has variously been stated to be 30 to 45 units per day, many observers have reported that greater accuracy with a diet which is entirely adequate permits sharp lowering of the insulin requirement. There seems little doubt that many, perhaps most, diabetics use more insulin than necessary (Wilder), or that the great majority of diabetics requiring insulin can be well controlled as to glycosuria and hyperglycemia with 20 to 30 units of insulin per day. This fact has been emphasized by other authors when they state that most of the difficulties in treatment are encountered among a relatively small percentage of the total group of users of insulin (Peck).

Best has said recently that "We do hope someday to make the 'ideal' insulin, which will be liberated only in response to need," so that hyperglycemia and hypoglycemia will be automatically controlled as in the nondiabetic. This thought gives the clinician the key to the problem as to the kind and dosage of insulin to be prescribed for a specific patient.

Since diet, insulin, and exercise, all three, influence the level of sugar in the blood, it must be assumed that there is a fair degree of constancy in the daily food intake as well as in the daily exercise. Therefore, in the following discussion it will be assumed that the diet is nutritionally adequate and the exercise is that which is necessary in a useful existence. The expression "duration of the insulin effect," will refer to that period of time during which the effect of a given dose of insulin is of *practical* value in its influence upon the blood sugar level.

Insulin is a specific hormone and the nature of its action is always the same. The obvious difference between the clinical effect of the different insulins is dependent upon the timing effect, and this timing effect is dependent upon the rate of release of the hormone from the site of injection.

The modifications incorporated in the formula of the specific insulin in use, regulate the rate of release from the site of injection, and, therefore, regulate the timing effect. Two of the available insulins are unmodified, namely regular or amorphous insulin and crystalline insulin. The latter, probably because of the addition of a very small amount of zinc to the formula, has a slightly greater duration of effect, although for all practical purposes these two quick-acting, relatively short-acting insulins are interchangeable in usage. Because of their quick action they must be administered more often than once daily when employed in the regular maintenance regime.

All other available insulins are modified, by the addition of a protein such as protamine or globin and/or the addition of varying amounts of zinc, and/or altering the pH of the basic insulin solution. These modifications all change the timing effect of the hormone. Peck has pointed out repeatedly that the manufacturers of insulin now have available the means to make almost any conceivable intermediate modification of insulin timing. But, actually we should aspire to the best quick-acting, short-acting insulin and the best slow-acting, long-acting insulin we can make to meet the needs of the largest percentage of insulin-using patients. This objective will tend to minimize the total number of available insulins, and thus minimize confusion in the use of insulin by the practitioner and the patient.

Let us assume, then, that in a great majority of cases we will encounter no difficulty in control of the blood sugar levels. First, we will be able to control diabetes in about one-half of the new patients we see on diet alone. If glycosuria is heavy and hyperglycemia is high, even without evidence of acidosis, or if time is an urgent factor, insulin may be employed from the beginning. However, many of these cases will come under control with diet and exercise alone. Of course, if the situation present is more urgent, the use of insulin may be mandatory from the beginning of treatment. When insulin is first used, unmodified insulin is probably most practical for such purposes. If the physician's judgment leads him to believe that insulin will be a necessary part of the maintenance program, protamine zinc insulin may be used from the beginning.

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*Presented at the annual meeting of the North Dakota State Medical Association at Grand Forks, May, 1950.

When unmodified insulin is employed, it is best administered in small doses before each meal, with each dose lowered or suspended as glycosuria disappears. If the continued need for insulin becomes manifest, at any time during the preliminary period of observation, there is plenty of time to decide upon a modified insulin and which one to employ. There is very good reason for the use of insulin at the beginning of treatment in order to bring the diabetic state promptly under control in the patient where the onset is considered to have been recent. That is that in these patients, degeneration of the island cells may be incomplete and, therefore, reversible to a considerable degree if functional overstrain is promptly removed.

Many new diabetic patients will prove, under observation by the physician, to be controllable on diet and exercise, without the use of insulin. If, within a reasonable period of time, perhaps two to four weeks, the need for insulin persists, an attempt should be made to administer the total daily insulin requirement as a single injection of one of the modified slow-acting insulins. Some will prefer globin insulin for this purpose. It is particularly helpful in those patients with high daytime and low nighttime needs. Some will prefer protamine zinc insulin, which is preferable to globin insulin in those patients where there is a greater nighttime need. For practical purposes, it may be assumed in the average clinical patient that during the first 12 to 14 hours after administration, 80 per cent of the dose of globin insulin is expended, leaving 20 per cent for the second 12 to 14 hours; whereas, with protamine zinc insulin, these percentages are 60 per cent for the first 12 to 14 hours and 40 per cent for the second. It is true, of course, that the greatest need for insulin exists during the first 12 to 14 hours after administration, since insulin is taken before the first meal of the day, and almost the entire daily diet is consumed within the first 12 to 14 hours. But it is of equal, if not of greater, importance, that insulin administered but once daily must have a practical overlapping of effect from day to day. That is, one dose must not be completely expended before the next dose becomes effective. This is essential for even and constant control and the safety of the patient.

The method of transfer from unmodified short-acting to modified long-acting insulin is usually simple, as long as the total daily dosage does not exceed 20 to 30 units. In general, when the daily insulin requirement exceeds 20 units, or at most 30 units, no long-acting insulin alone given as a single injection has proven satisfactory. There are rather rare exceptions to this, as are pointed out by authorities discussing the use of globin insulin.

Although many mild and some even moderately severe cases can be controlled well on 20 or even 30 units of protamine zinc insulin, beyond this range of dosage it is almost always necessary to employ the effect of both unmodified quick-acting, as well as modified long-acting insulin to obtain control. This may be done by using the two insulins as separate injections, both daily before breakfast, or employing them as a mixture. The most common proportion of the two types of insulin when taken as separate injections, is one unit of regular or crystalline insulin to two units of protamine zinc insulin, although these proportions may vary considerably with different patients.

Because of this fact, during the past five years that the use of mixtures has become popularized, confusion regarding the proportions employed in mixtures has arisen. The change in insulin timing effect created by mixing together short-acting and long-acting insulin has either been poorly understood or much too frequently overlooked. Peck has repeatedly emphasized that because of the distinctly different formulas of the two types of insulin, namely modified and unmodified, in order to accomplish a practical effect of the two types of insulin in a single injection, at least *three* parts of unmodified quick-acting to *two* parts of modified long-acting insulin must be employed. Any lower proportion does not change the timing effect materially from that of protamine zinc insulin alone. At present, the most common formula employed for mixtures is two parts of unmodified quick-acting insulin to one part of modified protamine zinc insulin.

Colwell, two years ago, presented excellent data on two patients—the data carefully prepared for timing studies and obtained under hospital observation—and concluded that the 2:1 mixture and globin insulin gave similar timing effect under such controlled condition. However, in our actual experience, this does not hold generally true.

Before leaving the subject of mixtures, which could be discussed much more exhaustively, space permitting, it should be again emphasized that 1:1 proportions in a mixture are almost identical in timing effect with protamine zinc-type of slow-acting insulin alone; that any lesser proportion than 3:2 is of little practical value; that 2:1 mixtures are most useful. In order to obtain any increased daytime effect from a mixture of quick-acting and slow-acting insulin as compared to the same number of units of slow-acting protamine zinc insulin alone, the proportions in the mixture must equal or better exceed three parts of quick-acting insulin to two parts of protamine zinc insulin. Mixtures are "tailor made" and some patients, especially those on high insulin dosage and high caloric intake may do best on mixtures as high as three or three and one-half to one.

A very important aspect of the use of long-acting 24-hour insulin of any kind is that no dosage may be employed as a single administration which delivers an insulin effect in excess of need during the second 12 to 14 hours after injection. Hypoglycemic effect must not occur during the sleeping hours, and yet the blood sugar level on arising must be reasonably near a normal level, with the urine excreted by the kidney at that hour free of sugar most of the time. If we are to continue to aspire to the administration of insulin once daily by a single injection in a large majority of patients, we must accomplish this without the unreasonable introduction of feedings between meals and without disturbance of normal sleeping hours by the taking of food or administration of insulin. In other words, the regime must be simplified rather than complicated.

Finally NPH50, as now being prepared for clinical trial, has certain physical characteristics entirely unlike any other insulin or mixtures of insulin. In most patients the timing effect is very close to that of the 2:1 mixture arrangement. Although the final formula for NPH50 has not yet been established, it will probably be neutral in reaction with a pH of about 7.2 and will contain approximately 50 mgm. of protamine to each 100 units of insulin. This is a much lower amount of protamine than is employed in preparing standardized protamine zinc insulin. The zinc content may be no greater than that of crystalline insulin. However, the striking physical difference is that NPH50 is a crystalline substance and, therefore, possesses a stability which is distinctive. Likewise this physical characteristic will make it possible to combine with it in the same syringe quick-acting crystalline insulin in whatever amount might be desired to control glycosuria following breakfast and yet not have to give any consideration to physical alteration of either insulin. Thus the timing effect of mixtures employing NPH50 will be that of each component of the mixtures. The timing effect of each component will not be altered by placing both insulins in the same syringe. This independence of action of each component in case mixtures are employed using NPH50 as one of the components will create a situation of stability which will be distinctly helpful in the management of many patients. This insulin retains the desirable overlap effect characteristic of protamine zinc insulin and is somewhat retarded in effect during the first few hours after administration. Therefore, where a standard breakfast results in a postprandial glycosuria, five or ten units of quick-acting insulin may be added to the syringe of NPH50 and will act in the same manner as if given separately.

It is expected that this new insulin will be capable of being used alone in a much higher percentage of diabetics using insulin than is protamine zinc insulin. As high as 75 per cent of patients may find it possible to maintain good control with this one insulin used alone. Also, it will be useful in those patients needing higher insulin dosage than 20 or 30 units which, as pointed out previously, is about the highest insulin requirement that may be met with protamine zinc insulin alone.

In attempting to discuss the insulins, certain well established orthodox practices should be pointed out. Difficulties will be avoided by most practitioners if only quick-acting insulins are employed in emergencies and complications. Every diabetic should be made familiar with insulin, how to administer it, when to use it, even though usually controlled on diet alone. Any program of diet, insulin, and exercise, arranged for a diabetic patient, must aim at continuity of blood sugar control between an accepted floor and an accepted ceiling. The objective must be to maintain the floor above the hypoglycemic level at all times, and the ceiling below the normal renal threshold for glucose. In other words, the more nearly we approach normal blood sugar values with a normal range between high and low and the more nearly we approach normal urine values, the more nearly to normal we have restored the patient. With the available insulins, including NPH50, we should be able to attain this objective without too much difficulty in at least 90 per cent of the diabetic patients that come under our observation.

SUMMARY

1. Emphasis is given to the need for consideration of the "timing effect" in selecting appropriate insulin or insulins, in the treatment of diabetes mellitus.

2. Some type of slow-acting, long-acting insulin is the basic insulin and should be employed in the maintenance regime alone, and once daily in all patients requiring insulin when the daily requirement does not exceed 20, or at most 30, units. The type of slow-acting insulin usually employed at present is protamine zinc insulin.

3. Quick-acting, short-acting insulin is most satisfactorily employed alone in emergencies and complications.

4. Attention is drawn to the changes in the basic formula and, therefore, in the "timing effect," when a short-acting and a long-acting insulin are mixed before administration.

5. Comment is made upon a new insulin, NPH50, which promises to be a more efficient long-acting insulin. Present indications are that this new insulin may be used efficiently *alone* in a higher percentage of patients requiring insulin, especially in those cases where the insulin requirement is above 30 units, than is now possible with protamine zinc insulin.

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Medicine is the only profession that labors incessantly to destroy the reason for its own existence.—JAMES BRYCE.

Cortisone and ACTH in Rheumatic Fever*

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As a natural consequence of the observations of Hench and his associates[1] on the favorable effect of Compound E (cortisone) and pituitary adrenocorticotropic hormone (ACTH) on patients with rheumatoid arthritis, it was only logical that these two hormones should be tried in the closely related disease, rheumatic fever. Here, likewise, the patients were favorably affected clinically and symptomatically. They experienced a rather prompt relief of their arthralgia and a rapid reduction in their fever, sedimentation rate, and P-R interval of the electrocardiogram.[2]

These initial observations made by Hench on three patients with acute rheumatic fever have now been extended to 14 patients treated with one or the other of the two hormones.[3] Additional studies have likewise been made by Massell,[4] Wilson,[5] Dorfman[6] and our group[7] at the University of Minnesota Hospitals confirming the observations of Hench. We have now studied the effect of these hormones in over 30 patients with acute rheumatic fever making special observations on the serum hyaluronidase inhibitor, the serum mucoproteins, and the sedimentation rate.

THEORETICAL CONSIDERATIONS

If it were not for the fact that cortisone and ACTH were found to have a favorable effect on the course of the disease in patients with rheumatoid arthritis, the hormones would probably not have been used in patients with acute rheumatic fever. Previous experimental studies might have led one to postulate that the use of these hormones in rheumatic fever would be contraindicated. Selye[8] has been able to produce rheumatic-like lesions in animals with an adrenal-like hormone (desoxycorticosterone acetate). Recently Lillehei[9] has also been able by a severe artificial "stress" in dogs (arteriovenous fistulas) to produce rheumatic-like cardiac lesions. Furthermore, it is known that rheumatic fever itself produces a "stress situation" thereby stimulating the adrenal gland. Yet, ACTH, a hormone liberated by the pituitary during times of stress, affects favorably acute rheumatic fever.

One observation by Seifert and his associates[10] might be of some value in helping us understand those mechanisms that produce a favorable result when ACTH or cortisone are given to patients with rheumatic fever. He studied the effect of various substances on the permeability of the joint membranes by a special technique. These membranes contain a large amount of hyaluronic acid, a compound that forms the ground substance of most cells in the body. Seifter found that hyaluronidase (enzyme from streptococci) and desoxycorticosterone acetate increased the permeability of the joint membranes above normal, and that adrenal cortical extract, ACTH, cortisone, and any other substance that produced a "stress" like reaction decreased the permeability of the membranes. Perhaps then these hormones work directly on the cells involved in order to produce the effect observed in rheumatic fever and rheumatoid arthritis. It is interesting to note this effect of desoxycorticosterone acetate in Seifter's study in view of the rheumatic-like lesions Selye had been able to produce by its administration.

EFFECTS OF THE HORMONES ON THE ACUTE DISEASE

Fever. Following the administration of ACTH, the patient's temperature usually returns to normal within four to 12 hours and stays there if the drug is maintained. In this regard, ACTH appears to be the most effective antipyretic now known. The action of cortisone, however, is somewhat slower than that of ACTH, as the temperature may not return to normal for 36 to 48 hours.

Arthralgia. ACTH usually gives prompt relief of the patient's arthralgia within four to 18 hours. Concomitantly the joint swelling likewise disappears. Cortisone produces a similar effect but frequently takes two to three days to give moderate relief.

Carditis. With few exceptions the carditis of acute rheumatic fever decreases in severity during the administration of ACTH and cortisone. This is evidenced by a return of the P-R interval of the electrocardiogram to normal, a slowing of the heart rate to normal, a decrease in the heart size, and a decrease or a disappearance of the heart murmur. In most of our patients, the heart murmur had completely disappeared six weeks after the hormone was started.

Dose. In our studies, the initial dose of ACTH varied between 40 and 100 mgm. per day depending upon the size of the child. This was given in four or six divided amounts at four or six hour intervals. Usually the amount of cortisone required to be effective was twice that of the ACTH (i.e. 80 to 200 mgm.). Cortisone apparently needs only to be given once or twice a day. Neither hormone should be stopped suddenly. Correctly given, the dose should be gradually tapered off. A minimum of three weeks administration of either of the drugs seems necessary to prevent immediate recurrence of symptoms.

Appetite. Both ACTH and cortisone seem to have a marked effect on the appetite. Regardless of the severity of the disease, within 24 to 48 hours after institution of the hormone, our patients began to eat moderate to extreme amounts of food. This increase in calorie intake undoubtedly accounted for a good share of the patients' weight gain. It was not unusual to have a patient double his or her caloric intake while receiving either ACTH or cortisone. Some of the weight gain of these patients was due to retention of fluids intra- and extracellularly, as a result of the sodium retaining properties of the adrenal cortical hormones. For this reason, the patients were weighed daily and the fluid intake and output were recorded. With the doses of the hormones mentioned above, no significant alterations in the blood pressure were observed in the group of patients treated by us. Hypertension should be looked for, however.

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*Presented before a Continuation Center Course on Cortisone and ACTH at the University of Minnesota, October 4, 1950.

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Psychological Effects. Along with the relief of the arthralgia and the increase in appetite, a number of the patients experience a mild euphoria while receiving the drugs. Some of our patients have also been followed by members of our child psychiatry staff, and no untoward psychiatric effects of the hormones have been observed.

Metabolic Alterations. Both ACTH and cortisone have been shown by others[11] to produce the following metabolic changes: a retention of sodium, chloride and water; an increased excretion of nitrogen, calcium, phosphate, potassium, and 17 ketosteroids; a decrease in the plasma gamma globulin and fibrinogen; gluconeogenesis; and mobilization of fat stores for conversion to glucose. Preliminary studies have shown that ACTH does not interfere with the antibody production mechanisms.

We have been particularly interested in the effect of ACTH and cortisone on the serum non-specific hyaluronidase inhibitor and the serum mucoproteins in rheumatic fever patients.

The non-specific hyaluronidase inhibitor is a substance present in the sera of all people, that increases markedly in amount during acute rheumatic fever and returns to subnormal values in inactive rheumatic fever. It is not an antibody and it will inhibit hyaluronidase from any source. Serum mucoproteins are proteins in the serum found normally in man that are rich in carbohydrate, hexosamine, and sulfur and low in nitrogen content. These proteins likewise become elevated during acute rheumatic fever. In patients with rheumatic fever *not* treated with ACTH or cortisone, the non-specific hyaluronidase inhibitor, the serum mucoproteins, and the sedimentation rate all seem to parallel each other during the course of the disease. When patients received ACTH or cortisone, however, in general the sedimentation rate and the hyaluronidase inhibitor level dropped rapidly to normal values within ten to fifteen days. This seemed to follow quite closely the subjective improvement in the patient's condition. The serum mucoproteins, however, were much slower in their return toward normal levels. This usually took three to four months. In instances in which the ACTH or cortisone was withdrawn or the dosage was cut too low before a substantial drop of the mucoprotein level had taken place, the patient had a recurrence of the disease. This occurred even though the dosage was not changed until the sedimentation rate and the hyaluronidase inhibitor level were normal. In general the level of the mucoprotein appeared to be a better guide of the rheumatic activity and the hyaluronidase inhibitor and sedimentation rate a better guide for the proper hormone dosage.

Complications. In the group of patients treated by us there were no severe complications observed. About one-half of them developed mild acne over the forehead, and all retained fluid to a mild degree but not sufficient to produce pitting edema. The metabolic alterations produced by ACTH and cortisone have to be carefully looked for and watched, however.

Prognosis

It is yet too early to say what over-all effect ACTH and cortisone will have on the course of the total disease of rheumatic fever. Certainly the effects of these hormones are dramatic during the acute phase of the disease. Whether the late cardiac damage will eventually occur has yet to be observed. We have not observed as yet any patients in whom the disease progressed while receiving either of the hormones. Occasional patients developed recurrences after being off the drugs for several months. Neither of the hormones appear to have a favorable effect in chronic rheumatic fever.

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Clinical Study of Physostigmine Preparations in the Relief of Muscle Spasm and Pain

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The present study was undertaken to ascertain what effects, if any, certain preparations of physostigmine in combination with atropine exhibited in their ability to relieve muscle spasm, particularly spasm involving the skeletal (voluntary) muscular system.

It has been shown recently that when the clinical effects of physostigmine are modified by simultaneous use of a proper proportion of atropine, there is also an effect upon skeletal muscle,[1] although it had been thought previously that physostigmine acted solely upon smooth muscle.[2] A desire to test this drug in the treatment of arthritics, who often experience muscle dysfunction accompanied by pain, prompted this study, for it was felt that any improvement afforded by a newer therapeutic approach would be well worth the effort involved.

Cohen and his associates[1] have reported that physostigmine salicylate and atropine sulfate give relief in skeletal muscle spasm in patients with rheumatoid arthritis and related rheumatoid conditions. This same author in collaboration with others[3] made a comparative study of the action of neostigmine (Prostigmin) and physostigmine in similar conditions involving muscle spasm. Neostigmine resembles physostigmine in its pharmacological action. They found that the action of physostigmine was similar to neostigmine in obtaining muscle relaxation in neuromuscular dysfunction, and was equally effective. They found further that physostigmine costs less and presented fewer side effects. Satisfactory relief was obtained in 60 to 70 per cent of the patients in this series. With relaxation of muscles associated with affected joints, there was a reduction in deformity. It was found that relief from pain followed indirectly from relaxation of muscles associated with the affected joints. Preventing or decreasing amount of muscle spasm prevented development of deformities, and if deformities already existed they were reduced.

There has been much discussion as to the supposed toxicity of physostigmine when compared to neostigmine. While Sollmann[2] considers neostigmine to be less toxic than physostigmine, Cohen is of the opinion that physostigmine is no more toxic than is neostigmine, and this is also my present opinion. This latter view is also expressed in *New and Nonofficial Remedies*,[4] "There is no satisfactory evidence that the symptoms produced by toxic doses of neostigmine salts are any less severe than those produced by comparable doses of physostigmine or its salts."

The nerve impulse is transmitted across the nerve synapse by means of acetylcholine. It is exceedingly active pharmacologically. It is hydrolized by cholinesterase. Physostigmine inhibits the hydrolytic action of cholinesterase, permitting an increase of acetylcholine in the body. The pharmacological action of physostigmine is in reality the action of acetylcholine. Physostigmine is classified as a cholinergic drug.

Atropine sulfate acts upon the neuromuscular junction, or muscle plate, and inhibits the action of acetylcholine there. It blocks the parasympathetic action of acetylcholine on smooth muscle of the gastrointestinal tract, the pupillary muscle, and the salivary gland.

Of recent interest is the use of cortisone and ACTH by Hench and his associates,[5] and others,[6,7,8] for the treatment of rheumatoid arthritis. These investigators report a lessening of muscle stiffness and improvement in articular and muscular function in treated patients, with relief of tenderness about joints.

It is interesting to note that solutions of physostigmine and atropine act similarly to curare and d-tubocurarine in rheumatoid spondylitis, which recently was discussed by Norcross, Robins and Lockie.[9] However, a solution of physostigmine and atropine does not give the untoward side reactions which are characteristic of curare, a dangerous drug in the hands of an inexperienced clinician.

In the past, the stabilization of physostigmine salts offered a difficult problem to clinicians who desired to use them. The fact that the compounds decomposed rapidly in solution[10] made it imperative that fresh solutions be prepared. Recently, however, a stable preparation has been offered commercially, and it is available in multiple dose vials. Atropine is combined with physostigmine to mask certain undesirable actions of the latter drug. This was one of the medications employed in the present studies.

The importance of passive and mild exercise for relief of skeletal muscle spasm and the importance of posture and position in bed to prevent development of deformities in rheumatoid arthritis, has been emphaszied recently by many rheumatologists, among whom are Hollander,[11] Cecil,[12] Steinbrocker,[13] Holbrook[14] and the writer.[15]

Two solutions were used in the investigation, one an aqueous solution and the other an oil solution. Each cc. of the aqueous solution contained 0.6 mg. each of physostigmine salicylate and atropine sulfate, in isotonic solution of sodium chloride. It was administered intramuscularly in one cc. doses. Each cc. of the oil solution contained 1.2 mg. of physostigmine salicylate and 1.2 mg. of atropine sulfate, in sesame oil. This was administered intramuscularly in 0.5 cc. doses.

Rheumatoid arthritis. Fifty-two patients whose rheumatoid symptoms were of at least 18 months' standing and who had received at least three injections, were included in the series for study. They included both males and females, both white and Negro, and were in the age range of 14 to 82 years. The majority were in middle age. The chief complaints were pain and swelling of joints, difficulty in motion, and general malaise. All had previously received diversified treatment for their arthritis from us or elsewhere. Some had received injections of gold compounds, others bee venom, and still others had been given sulfa drugs. Most of them had received salicylates and some form of physiotherapy. Ten per cent of these patients were bedfast, the remainder ambulatory. In 90 per cent of the patients a single joint was involved, usually the arm or leg, and in the remainder two or more joints were involved. In 90 per cent of the patients the pain was rated as severe and 75 per cent exhibited swelling of a joint. They were given a total of 1100 injections over a period of 18 months, ranging in number per patient from three to fifty. When employed, most of these patients were farmers or laborers. They lived in the south near Mobile, Alabama, although the study also includes a few patients from the north. Many of them had lived on a low nutritional level.

The effects from the injections were determined during the first 30 minutes following injection and by questioning patients at the time of the succeeding visit. The findings are given in Table I.

Table I

	No. of Patients	Average No. of Injections	Relief in 10 Min.	Relief in 30 Min.	Length of Effect
A* Aqueous	28	26.2	11	28	3 days
B* Oil	24	15.3	6	24	5 days

Patients experienced varying degrees of relaxation within 30 minutes from the time of injection, as exhibited by increased mobility of joints with decrease in severity of pain. As treatment continued, they obtained with each injection a greater degree of relaxation and articulation. In patients receiving the aqueous form, a slow return of stiffness was sometimes evident after three days. As the number of injections increased, the period of relief lengthened somewhat. This was likewise true of patients receiving the oil injections, but the period of relief was longer. Relief from pain followed indirectly from relaxation of skeletal muscle spasm. Swelling subsided more slowly than pain.

In general, bedfast patients became ambulatory after six injections of the aqueous solution and ambulatory patients were able to return to gainful occupation after six to ten injections.

All patients showed marked subjective improvement. They felt better, they were more relaxed, they were more self-reliant, and were relieved of the psychic trauma of invalidism.

Patients were instructed with respect to improvement of their diet and to exercise as freely as possible up to the point of discomfort. It was unnecessary to give analgesics.

Relapses of stiffness occurred in patients who were tardy in their return for further injections. Neverthless, they responded satisfactorily, some better, to a succeeding series of injections.

At the time of the first injection, it is advantageous to demonstrate the prompt improvement in motion articulation as a means of encouragement to the patient to follow the regimen of treatment recommended for him. "Failures" may be explained many times by failure to look for prompt relaxation and to allow the patient consciously to experience it.

Myositis. Thirteen patients with idiopathic myositis were given short-wave therapy with two to four injections of Phyatromine.® Excellent relaxation was obtained. Recurrences followed change in seasons and weather, and those environmental factors that usually cause recurrence of symptoms. Traumatic myositis likewise responds to the medication.

Muscular strains. Two to four daily injections of the aqueous Phyatromine were given to 18 patients with muscular strains. They obtained relief in strains from traumatic injuries of this type. Diathermy may be used simultaneously, if so desired.

Discussion

Administration of a solution of physostigmine salicylate and atropine sulfate (Phyatromine®) to patients with rheumatoid arthritis, either in aqueous or oil solution was promptly followed by relief from muscle stiffness, improvement of joint muscle function, and decrease in tenderness of joints. These clinical findings seem to parallel the reports of Hench and his associates[10] using Compound E.

Thus, it appears that physostigmine relieved voluntary muscle spasm in rheumatoid conditions, or those caused by trauma, by breaking the nerve reflex arc. It acts upon certain cells in the spinal cord which are a part of the reflex arc pattern. The best results were obtained when daily injections were given until maximum improvement was obtained. Injections were then given less and less frequently, until patients were instructed to return only when they needed relief from recurring pain.

Because of economic conditions and the inconvenience of daily trips to the office for injections, the majority of the patients studied were unable to follow a daily schedule of injections. They generally received twice-weekly or weekly injections. It was possible to observe the length of the relaxing effect from a single injection in these patients.

Thirty-four per cent of the patients receiving the aqueous injection reported varying degrees of relief from muscle stiffness in ten minutes and all within 30 minutes. Patients receiving injections twice-weekly or weekly, reported improvement lasting on the average of three days. As the treatment period was continued in this group, the intervals between injections were lengthened. Patients receiving injections of the oil solution experienced relief for longer periods of time. Bedfast patients generally became ambulatory following three to ten injections.

As muscular and articular function was improved, the patients recovered their ability to execute more complex movements, such as feeding and dressing themselves and caring for their own toilet. In these respects the findings compare with those of Hench and his associates using Compound E. Many were able to return to gainful employment. All experienced improvement of appetite, gain in weight and recovery of their feeling of wellbeing. These clinical effects helped them to get over the psychic trauma of having a crippling disease.

The side effects of this medication are those characteristic of atropine. They include blurring of vision and drying of mouth. The extent of reaction varies with patients. Two patients exhibited syncope and one patient showed puffed lips, ringing in the ears, and difficulty in deglutition. A difference has been noted between the frequency and extent of blurred vision and decreased salivary secretion between patients in the north and south receiving the same dosage. The side effects appear less frequently and less intensively in patients in the north.

It has been shown that passive or mild exercise of the involved muscles and joints in rheumatoid arthritis carried out over a period of time seems to be followed by apparent relief from stiffness and freedom of motion. Movement of muscle *per se* tends to relieve stiffness. It is possible that the benefits derived from mild exercise are due in part to increasing the metabolic rate of skeletal muscle, beneficial effects arising from liberation of heat within the muscle due to metabolism of carbohydrate, improvement of circulation and relief from anoxia that might be present, and a restoration of the series of continuous reactions that proceed in the physiological functioning of skeletal muscle.

To utilize physiotherapeutic procedures many times increases the cost of medical care beyond the ability of the patient to pay for them or introduces inconveniences rather than rendering them impractical or impossible for the individual patient. However, by using a solution of physostigmine and atropine salts, it is possible to decrease stiffness and tenderness, permitting the patient to use the affected muscles and joints more freely, which in turn has a relaxing effect. Thus, a cycle of events is set up aiding the natural forces in correcting the pathological, mental and physical states.

We have found that a solution of physostigmine salicylate and atropine sulfate (Phyatromine®) gives relief promptly in spasm and discomfort in myositis and in muscular strains. While the solution of physostigmine and atropine in oil gave longer effects, we found the aqueous solution to be more convenient when frequent injections were required.

CONCLUSIONS

1. Administration of solution containing physostigmine and atropine (Phyatromine®) to patients with rheumatoid arthritis and idiopathic myositis is generally followed by prompt relief from stiffness of involved joints and muscles and improvement of articular and muscular function.

2. Subsequent to relief from muscle spasm, there is a decrease in tenderness of the soft structures about the joint and in acute cases, a decrease in swelling.

3. Relaxation of muscle spasm apparently prevents the development of deformities, and if deformities have occurred, some patients respond by reduction of the deformities. The extent of reduction of the deformed joint depends upon the amount of fibrosis and ankylosis which may have occurred.

4. With decrease of pain and improvement of articular and muscular function and the recovery of the ability to execute complicated movements of the affected joint, there is an improved mental attitude of the patient, accompanied by improvement of nutrition of patient.

5. Succeeding injections give the patient more marked and sustained relief than do the primary injections.

6. Administration of a solution of Phyatromine® to patients with muscular strains, due to trauma, gives relief from associated skeletal muscle spasm.

7. There is no evidence that a solution of physostigmine and atropine benefit the arthritic process *per se*. Together, they seem to provide by their coaction, palliative relief, permitting the patient to recover the ability to use affected muscles and joints.

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This research was aided by a grant from the Kremers-Urban Company of Milwaukee, Wisconsin, who manufacture a solution of physostigmine salicylate and atropine sulfate under the trade name of Phyatromine.

Rat-Bite Fever Due to Streptobacillus Moniliformis

Report of a Case Occurring in Minnesota

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Two micro-organisms, Streptobacillus moniliformis and Spirillum minus, which appear in no way related to one another, are capable of producing in man the clinical entity known as rat-bite fever. The etiological differentiation between the two infections appears to be impossible on clinical grounds and must be made by bacteriologic methods. The animal most often the source of the organisms is the rat and transmission is via bite. One epidemic of the streptobacillary form of the disease, apparently milk-borne, has been described. This epidemic, which occurred in Haverhill, Massachusetts, was reported by Place, Sutton, and Willmer in 1926[1] and constitutes the first concise description of the clinical entity of rat-bite fever due to Streptobacillus moniliformis. From their papers[1,2] stem the terms "Haverhill fever" and "erythema arthriticum epidemicum."

Spirillum minus, a spiral micro-organism demonstrable by dark field examination, produces the so-called "Oriental" form of the disease termed "Sodoku." This type has been recognized as an entity a good while longer than that due to Streptobacillus moniliformis, chiefly because the bacteriologic recognition of Streptobacillus moniliformis has become universal only in recent years. Sodoku is by no means confined to the Orient. Arsenicals are apparently quite specific for Spirillum minus infections.

Streptobacillus moniliformis is an extremely pleomorphic gram-negative rod that requires enriched media for growth. It is a normal inhabitant of the nasopharynx of approximately 50 per cent of laboratory rats.[3] Characteristically it produces in man an illness beginning abruptly with high fever and chills. A skin rash, usually irregular, blotchy, maculo-papular, and particularly apt to involve the extremities, appears within a few days. Polyarthritis, which may migrate, appears at any time within two weeks of the onset. Recovery often occurs spontaneously but cases of prolonged illness with a relapsing type of fever and painful chronic arthritis result occasionally.[2, 1, 5, 6, 7] Six deaths have been reported [6, 7, 8, 9, 10, 11]; in four of these necropsy showed marked inflammatory changes in the myocardium and/or the endocardium. The organism may be cultured directly from the blood or joint fluid, or after animal inoculation. The development of a significant agglutinin titer in the serum may also be diagnostic. Rat-bite fever due to Streptobacillus moniliformis has been treated successfully with both penicillin [12,13] and streptomycin.[14]

An exhaustive review of rat-bite fever has been compiled by Brown and Nunemaker.[7] An attempt at differentiation between the two types on clinical grounds alone has been concisely tabulated by Altheimer, Snyder, and Howe.[14]

CASE REPORT

A 24-year-old white male graduate student, working with laboratory rats in the department of neurophysiology, was seen initially in the Outpatient Clinic of the Students' Health Service on December 14, 1949, with the complaint that a rat had bitten him on the tip of the right forefinger. This particular rat, and a few others in the colony, had been noted to have signs of coryza. There were no signs of inflammation. The wound had been treated with an antiseptic solution; he was, therefore, given a "booster" dose of tetanus toxoid and discharged. The following day there were signs of a mild pulp space infection about the area of the bite and he was given one injection (400,000 u.) of penicillin, following which the inflammation quickly subsided.

On January 11, 1950, he developed mild coryza, fever, chilliness, malaise, and frontal headache. The next day a rash appeared on the dorsum of the hands and with continuance of systemic symptoms the rash appeared on the dorsum of the feet and extensor surfaces of the elbows. During the two days prior to his admission to the hospital on January 16, 1950, he developed mild arthralgia in both wrists and extremely severe pain on movement of the right ankle. His past health had been excellent and there was no history of urethritis or rheumatic disease. The laboratory rats had bitten him on previous occasions over a period of six months but no symptoms had developed as a result.

Physical examination showed a well nourished febrile young man whose chief complaint was an extremely painful right ankle. The pertinent findings were: (1) a red, irregular, maculopapular rash on the extensor surfaces of the arms and legs and the dorsum of the hands and feet; (2) a small non-tender lymph node in the right epitrochlear and right axillary regions; (3) a palpable spleen tip; (4) a right ankle that was extremely painful on any movement, but which evidenced no other inflammatory sign. The temperature was 103.2°, the pulse 120, and the blood pressure 120/70. There was no sign of the original rat bite.

The white blood count was 10,400 (77 per cent neutrophils) and the erythrocyte sedimentation rate 31.0 mm. by the Westergren method. There was no anemia and the urine was not abnormal. The heterophile antibody titer was 1:14. Agglutinins to the para typhoids, B. abortus and B. tularense, were absent. There was an atypical agglutinin titer of 1:320 to B. typhosus. Roentgenograms of the chest and right ankle showed no abnormalities. The electrocardiogram was within normal limits. The Wassermann reaction was negative. Streptobacillus moniliformis, with typical colony formation, was grown out of two pre-treatment blood cultures. The organism was also recovered after mouse inoculation with whole blood. Attempts to demonstrate Spirillum minus in serum from abraded skin lesions and after guinea pig inoculations with similar material revealed no evidence of this organism. It was found that the Streptobacillus moniliformis recovered from this patient was completely inhibited by 0.1 unit per cc. of penicillin and similarly inhibited by five micrograms per cc. of streptomycin.

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During the two days prior to treatment the arthralgia of the wrists became more severe and fluctuated a good deal. The rash became more prominent with the formation of a few tiny pustules. Crystalline penicillin in doses of 100,000 units intramuscularly every six hours was begun on the third hospital day and continued for five days. By the fourth day of therapy the temperature had returned to normal, the rash had vanished, and the only complaint was of mild pain in the right ankle on walking. On February 7, 1950, he was seen again as an outpatient; at this time there were no complaints, the physical examination was entirely normal, and the white blood cell count and sedimentation rate had returned to within normal limits. Blood cultures on this date and on March 10, 1950, were sterile. He has now remained asymptomatic for four months. Agglutinin titers to the Streptobacillus were performed on serum obtained on January 18, 1950, and February 7, 1950, by Lucille B. Robinson, bacteriologist at the Veterans' Administration Hospital in Washington, D. C. The serum obtained in the earlier phase of the illness showed no agglutinin titer; that obtained following clinical recovery showed an agglutinating titer of 1:80.

Summary

1. A case of rat-bite fever in a laboratory worker due to Streptobacillus moniliformis, treated successfully with penicillin, is reported. It seems surprising that more infections of this nature do not occur recognizably in persons using rats as experimental animals.

2. The suggestions of Brown and Nunemaker regarding terminology[7] are followed; i. e., that the clinical entity may be described as rat-bite fever but that the etiologic agent should be specified, and also the terms "Haverhill fever" and "erythema arthriticum epidemicum" should be reserved for epidemics similar to the one described by Place, Sutton, and Willmer.[1]

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THE RECORD IS BETTER THAN WE THINK

Self-analysis of our health resources and the use we are making of them is vital. So much health progress has been made in such a short time that the present picture is one of confusion. Some areas of the country have moved ahead so fast that others have been left behind. In several departments of medicine, for instance, the conquest of disease has been so thorough that we are appalled by the contrast in other departments. We seem to be saying: "Why can't we do for cancer, heart disease and polio what has been done for smallpox, typhoid and diphtheria?" But we are doing these things. Cancer is undergoing the most intensive study every applied to any single disease. Heart disease is much less prevalent in youth and middle age than it used to be only a few years ago. Victims of polio now have the benefit of earlier diagnosis, and therefore earlier treatment, than was possible only recently.—From an address *The Nation's Health,* by Admiral William H. P. Blandy, U.S.N. (Ret.)

The Diagnosis and Treatment of Hemangiomas*

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Hemangiomas are grouped under nevi which include a variety of circumscribed new growths of congenital origin (birthmarks), which may be present at birth or occur in later life. Nevi may develop from both epidermal and mesodermal structures, and seem to originate from cell rests. Angiomas represent hyperplasia of blood or lymph vessels and stand in contrast to so-called nonvascular nevi in which epidermal or connective tissues predominate. Angioma is the term applied to a tumor composed of newly formed vessels; hence, an angioma arising from blood vessels is a hemangioma. In certain cases both lymph and blood vessels are hyperplastic to which the term hemolymphangioma has been applied. The following are the chief types of vascular nevi: (1) *nevus flammeus or port wine stain* which is a capillary hemangioma characterized by flat, non-elevated pink, red or purplish lesions; (2) *hemangioma simplex* or *strawberry mark* which is composed of dilated capillaries and small veins or arterioles; (3) *cavernous hemangioma* which is made up of larger and more widely dilated vessels with narrow connective tissue septa.

Nevus flammeus; port wine stain:

Port wine angiomas are frequently unilateral, located on the face and neck, although they may be extremely extensive and involve large areas of the body. They are most frequently encountered in children and may be single or multiple and range from small red macules to large purple patches. Their surface is usually smooth, although occasionally nodular outgrowth may be present. The occurrence of this type of angioma in the nuchal region is one of the commonest congenital defects of the skin.

Hemangioma simplex; strawberry mark:

These lesions may be present at birth or develop within the first few weeks of life. They vary extremely in size, and range in color from bright red to purple. Most of the lesions are slightly raised and are sometimes broken up into small components between which the skin is telangiectatic. They occur most frequently on the face and neck, although they may appear on any part of the body. Ulceration or hemorrhage occur occasionally.

Cavernous Hemangioma:

Cavernous hemangiomas vary in size and shape, but are in general round or oval and bright red to deep purple. Their consistency, as a rule, is spongy but if they persist into adult life may become more fibrous. As is the case in hemangioma simplex, these lesions occur most frequently about the head and neck, but may be found on almost any part of the body. A more superficial variety involves the skin and subcutaneous tissue and is elevated above the surface. In deeper types the subcutaneous or submucous portion of the angioma may be larger than the visible cutaneous lesions. The skin overlying cavernous hemangiomas may be of normal color or the site of superficial vascular nevus. In lesions which have undergone trauma with subsequent hemorrhage or ulceration, considerable fibrous tissue may be formed.

Treatment of Hemangiomas

There are several acceptable methods of treating infantile hemangioma which include radium, roentgen rays, injections of sclerosing fluid, solid carbon dioxide, high frequency coagulation, surgical removal, and no treatment at all when a spontaneous involution is expected.

There are many competent dermatologists who firmly believe that spontaneous involution occurs within the first five or six years of life in the majority of hemangiomas of the cavernous and strawberry type, and that if size, location, sex and parents' cooperation justify expectant therapy this should be the treatment of choice. Most dermatologists who hold this view believe that if the hemangioma is large and cavernous or small and easily removable or if it is located on an exposed part and the parents are unwilling to wait five or six years for spontaneous involution, the form of active therapy considered the best should be administered.

Undoubtedly there are advocates for treatment by means of injections of sclerosing fluids. Severe local reactions may occur and the local discomfort is frequently lengthy. Ulceration with subsequent scarring is not infrequent; hence, this method is being used less and less.

In hemangiomas of the strawberry and cavernous types, especially the latter, applications of solid carbon dioxide in mild dosage frequently produce completely satisfactory results. The carbon dioxide is collected in a chamois-skin bag from which it is transferred to molds of various sizes to suit the individual lesion. The molded solid carbon dioxide is then applied with moderate pressure from three to ten seconds to the hemangioma. Swelling and bulla-formation followed by erosion and crusting result in most cases. Uneventful healing occurs, however, within a period of two to four weeks, leaving a soft supple, non-hypertrophic scar which later fades almost into invisibility. Treatments may be repeated within three to four weeks depending upon the degree of local reaction. The number of treatments varies in the individual case. Prolonged applications (30 to 60 seconds) under firm pressure are not advocated because of the intensity of the reaction.

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Most hemangiomas of the cavernous and strawberry types are responsive to both x-rays and radium. The injudicious use of either of these agents can produce serious or even disastrous sequelae; hence, such treatment should never be attempted by one who is not thoroughly versed in the details of application of these modalities. The production of radiodermatitis as a result of the treatment of cavernous or strawberry hemangiomas is to be heartily condemned. Such sequelae persist throughout life and not only lead to disfigurement, but may eventually predispose to squamous cell epithelioma of a high degree of malignancy. The careful use of x-rays and radium, however, by those who are properly equipped and thoroughly trained in dermatology and radiotherapeutics, constitute an acceptable form of treatment. Attention should be called to other occasional disastrous sequelae of radiation therapy, such as atrophy of bones, the development of sarcoma arising in irradiated bone and atrophy of the female breast following the use of radium for hemangioma.

Because of the fact that the hazards of any effective form of treatment of nevus flammeus are so great it is best not to treat them at all. Radium, x-rays, solid carbon dioxide and other modes of treatment have made the lesions worse rather than better in most cases. Most of them can be satisfactorily concealed by cosmetic preparations now on the market.

Meet Our Contributors

Forrest Hood Adams, a graduate of the University of Minnesota medical school, is a specialist in pediatrics. He is a member of the Northwest Pediatric Society, county and state medical societies, and A.M.A. He was a National Research Council fellow in 1948-49, and the recipient of a USPH research grant in heart disease in 1949-50.

★

Donald W. Cowan was graduated from the University of Minnesota medical school, serves there now as assistant director of the Students Health Service and associate professor of public health. He is a member of county and state medical societies, A.O.A., Sigma Xi, and was the recipient of the Charles Lyman Greene prize in physiology.

★

Donald J. Cowling, president emeritus of Carleton College, Northfield, Minnesota, has served as president of the American Council on Education and the Association of American Colleges, and as chairman of the Board of Advisors of the National Student Federation of America. Since April 1943, Dr. Cowling has been chairman of the Committee of Founders of the Mayo Memorial.

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K. W. Stenstrom received his Ph.D. in physics from the University of Lund, Sweden, and used a Swedish-American fellowship for a year's study at Harvard. He served as physicist for the State Institute for the Study of Malignant Disease in Buffalo, New York from 1920 to 1926, is now professor of biophysics in the department of radiology at the University of Minnesota as well as director of radiation therapy.

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Book Reviews

Current Therapy 1950—*Latest Approved Methods of Treatment for the Practicing Physician*, edited by Howard F. Conn, M.D. Consulting Editors: M. Edward Davis, Vincent J. Derbes, Garfield G. Duncan, Hugh J. Jewett, William J. Kerr, Perrin H. Long, H. Houston Merritt, Paul A. O'Leary, Walter L. Palmer, Hobart A. Reimann, Cyrus C. Sturgis, Robert H. Williams. 736 pages. Philadelphia and London: W. B. Saunders Company, 1950. $10.00.

This volume, the second in this series, is a record of current treatment procedures as practiced by the more than 250 contributors represented. As Howard Conn, the editor, says, "It is designed to be complete in itself and to contain all the information that the busy physician needs in order to treat the variety of disease manifestations which confront him."

The book is well indexed, clear and concise, and gives several recognized alternatives for each problem. It could easily be called the best book on treatment now available for quick use in the doctor's office. It is a book that should be included in every physician's armamentarium. R. T.

Communicable Disease, edited by Roscoe L. Pullen, A.B., M.D., F.A.C.P. 1035 pages, 253 figures, 35 illustrations and 20 color plates. Philadelphia: Lea and Febiger, 1950. $20.00.

This is a very comprehensive volume including every disease ordinarily included under this title as well as others not ordinarily discussed in treatises on communicable disease. Emphasis is placed, where proper, on purely communicable aspects, but each subject is presented with a complete discussion of the disease under consideration. Two good examples are the subjects of rheumatic fever and brucellosis. Another example of the broad approach to the subject is the inclusion in the section on "Communicable Disease with Predominant Skin Manifestations," the subjects of mycetoma pedis, actinomycosis blastomycosis, coccidioidomycosis, and histomoplasmosis.

A rather fascinating appendix is entitled "Pediatric Procedures Helpful in the Management of Communicable Diseases." This concise appendix includes much information, such as dates of dentition, fluid requirements of infants, artificial feeding formulae, diagnostic and therapeutic procedures in infancy and childhood, routes of administration of fluid and blood, treatment of diabetic acidosis, suggested pediatric prescriptions, all of great practical importance to the pediatric specialist and to anyone dealing with children.

The field of therapy is well covered, including the use of the most recent antibiotics.

The physical set-up and the illustrations are good and the printing makes for easy reading. The reviewer liked the contents index as well as the general index. It is recommended wholeheartedly to every physician, although probably of greatest interest to the pediatrician, internist and general practitioner. R. B. R.

Simmonds' Disease: *Extreme Insufficiency of the Adenohypophysis*, by R. F. Farguharson, M.B., F.R.C.P.(C). Edited by Willard O. Thompson, M.D. First Edition. Springfield, Illinois: Chas. C. Thomas, 1950. 89 pages. $2.00.

In this concise monograph the author has given the significant pathological and clinical findings of the characteristic state of extreme insufficiency of the adenohypophysis recognized and described by Simmonds. The destructive lesion, chiefly ischemic necrosis, in a great majority of cases is due to infarction occurring after severe hemorrhage in the puerperium. The retrogression of the gonads, thyroid, and adrenal glands, as well as microsplanchnia, are important features and with the clinical picture of the "thin, wrinkled and pale patient" are given adequate attention. This is a valuable summarizing essay.

C. A. McK.

Child Psychiatry, by Leo Kanner, M.D. Enlarged second edition. 752 pages. Springfield, Illinois: Charles C. Thomas Company, 1950. $8.50.

In preparation for the 1930 White House Conference on Child Health and Protection, a special subcommittee included in their report some far reaching conclusions. Among these were "adequate medical care of the child cannot be given without intelligent attention to any intellectual and emotional difficulties which may be present." They further reported "When trouble arises and the individual child is in distress, a well-informed and alert physician is the obvious advisor." Dr. Kanner's first edition of *Child Psychiatry* was offered as an attempt to fulfill the needs thus expressed. It was the first textbook on child psychiatry published in the English language. In it he attempted to cover the entire field of children's personality disorders on a broad, objective, unbiased and practical basis. Although it was intended primarily for physicians and medical students, it also proved helpful to those interested in child behavior problems: social workers, psychologists, sociologists, educators, juvenile court workers and others. Five printings of this edition were mute evidence of both the need for such a text and the success of Dr. Kanner's book in meeting this need.

Since publication of the original book, child psychiatry has made tremendous strides. To keep up with these advances, the author has reorganized, rewritten and expanded his original work. Although still psychobiologically oriented, Dr. Kanner has departed from the original Meyerian terminology that made the first edition somewhat difficult to understand for physicians and others not familiar with this psychiatric language.

This work makes available the vast experiences of the author in his everyday contact with the pediatricians and private practitioners, his consultation work in clinic and dispensary, his teaching activities and his collaboration with various child-caring agencies. It reflects the integration of his studies with a great psychiatrist, Adolph Meyer, and a great pediatrician, Edward Park.

The author does an exceptionally good job of bringing out the theories and techniques which he deems sound in practice as well as in theory. He describes clinical conditions comprehensively and explains their pathogenesis and psychodynamics.

The book is divided into four parts. Part I outlines fully the history of child psychiatry. Part II is concerned with the basic orientation of child psychiatry. It includes consideration of age, physical condition, intelligence, emotion, personality attitudes of parents, teachers, physicians, the group and a consideration of the material environment. Part III takes up clinical considerations. It covers symptoms, initial contact, the case history, problems of diagnostic adequacy, orienting examinations, projective methods, psychotherapy, situational therapy, psychiatric social work and prevention. Part IV, Phenomenology, is divided into three sections. The first section is on personality problems arising from physical illness. The second section is on psychosomatic problems. The third section is a comprehensive study on problems of behavior.

The reviewer enthusiastically recommends this book as a text, for references purposes or as a source of information to all whose work requires an understanding of the emotional aspects of children. P. C. B.

Amusing Quotations for Doctors and Patients, edited by Noah D. Fabricant, M.D. 150 pages. New York: Grune & Stratton, Inc., 1950. $3.00.

Patients as well as doctors will enjoy browsing through the quotations of this lively volume, drawn from sources as diverse as William Osler and Francis Bacon, and touching on almost every phase of medical practice. An excellent book for the waiting room.

V. L. D.

The JOURNAL LANCET

Official Journal of the American College Health Association
Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatrics Society

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Editorial

THE CONTROVERSY OVER EUTHANASIA

As in other situations in which deep emotions have been aroused, public discussions about euthanasia have generated much more heat than light. One reason is that words are being bandied about without serious regard to their true or full meanings. Physicians owe it to themselves to be informed fully and accurately as to what euthanasia is and is not. They may disagree among themselves as to its ethical propriety and its practical safety, but they should not follow the layman in loose talk about what it entails.

The proponents of euthanasia urge that a properly safeguarded legal procedure be set up whereby a person who is adjudged to be in sound mind may petition a court to give permission to the petitioner's physician to terminate life by painless means, if certain conditions are met. These conditions include a unanimous determination by a board of experts, including the physician of the patient's choice, that the patient is suffering from a disabling and painful disease from which there is no reasonable hope of recovery. They include the voluntary petition of the patient made under conditions precluding the possibility of duress, and they include a determination that the patient was sane at the time of the petition.

Euthanasia does not include so-called "mercy-killing" by physicians or others acting at their own discretion and upon their own authority. It does not put responsibility upon any one person, nor upon physicians alone. It is not a procedure by which anyone could be "put out of the way" by heartless relatives or guardians. It could not be used in the case of mental defectives of any sort.

Euthanasia as conceived by its advocates would be a safeguarded legal procedure by which a sane person suffering from an intolerable, incurable disease, might spare himself and his loved ones a long period of hopeless agony while waiting to stop breathing.

The ethics of euthanasia are, of course, susceptible to argument. In essence the question is this: Does a sane person have a social right to have his life terminated when it has become a burden to himself and to others? Society has not generally denied itself the right to terminate lives at its discretion. Capital punishment for crime is practiced in most civilized countries. It seems difficult to harmonize approval of capital punishment with disapproval of euthanasia. If it is ethical for society to terminate lives for its own penal purposes, how can it be unethical for it to do likewise for merciful purposes. In both instances the act is that of producing death prematurely. To be sure, motives determine the propriety of actions. But when has self-protection been a more worthy incentive than sympathy?

Euthanasia as a legalized procedure would unquestionably be a better system than bootleg mercy-killing. Perhaps it would also be a better system than that of simply letting a hopelessly incurable patient die, as for example of thirst and starvation when only parenteral feeding is possible in a disease such as cancer of the alimentary tract.

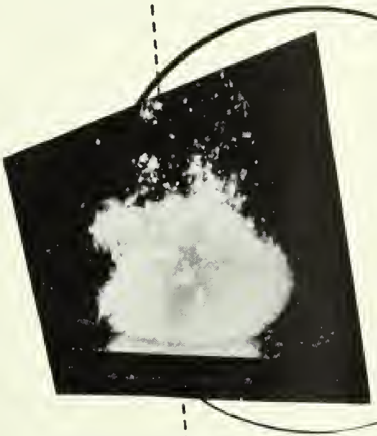
On the other side of the ledger is the tradition of medicine to heal and to prolong life at any and all costs, at least to the physician. On this score one should remember that the good physician also eases pain. Here one deals simply with a competition between major aims. The dilemma should be solved in the interest of the patient and society. There is, of course, also the problem of determining what diseases really are incurable. On the latter score common sense supplies some answers. No physician believes seriously that new advances in medicine which may be made tomorrow will provide means to restore victims of extensive damage to brain substance to pleasurable life. No one believes either that regeneration of tissues in vital organs displaced by neoplasms is a reasonable prospect for persons debilitated today by carcinomatosis. In other words since regeneration of functionally significant central nervous system cells, renal parenchyma and many other structures has never been observed we have good reason to believe that new developments in these fields, even if they come, will not help persons suffering today. The outside chance that they might should be weighed against the virtual certainty, from a statistical viewpoint, that they will not.

The problem of euthanasia is certainly not one for physicians to decide alone. However, it is a problem in which medical thought, ethics and practice are of the highest importance. The medical community should lead the thinking of the public at large in this matter. The issue is not an academic one. Certain physicians have already, unfortunately perhaps, taken the matter into their own hands for personal decisions. As in the problem of therapeutic abortion there should be legal safeguards and processes for the conscientious and humane physician.

M. B. V.

Reprinted from
1870

We need a medical journal for the purpose of hearing from those who will not, or can not talk—from those who sit on the back seats—whose experience is only excelled by their modesty; we refer to the country doctor; one who from the nature of circumstances is compelled to know a great deal, and say very little because he has no one to assist him in an emergency, nor has he any one to tell of his success. Now, we desire to hear of some of these heroic deeds. In town if we have a difficult case we simply divide the responsibility with our professional brethren, and the timid transfer their case to the shoulders of the more daring. Not so with the country doctor; they oftentimes can neither divide or shift the responsibility; they must carry it, and be alone responsible for the consequences. Often have we listened in wonder at the simple recitation of their daily routine of practice; from these men do we want to hear, and we want them to write as they talk, straightforward, to the point.—BREWER MATTOCKS, M.D.: "Our Journal." *Northwestern Medical and Surgical Journal* I:121, 1870.



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News Briefs

North Dakota

Doctors Honored . . .

Dr. Roy Lynde, veteran Ellendale physician, was honored August 31 on his 76th birthday at a community party attended by some 800 persons, from all parts of Dickey county. A portrait of Dr. Lynde, drawn by Daniel Garber of New Hope, Pennsylvania, was on display. This portrait will be hung in the Lynde memorial ward of the community hospital which is now in process of construction.

* * *

September 10 was Dr. John Simon Appreciation Day in Napoleon, in honor of the man who had looked after the community health for 37 years. Dr. Simon, a graduate of the Chicago College of Medicine and Surgery, came to Napoleon in 1919, and is still active in practice at the age of 75.

* * *

A drive has been opened to obtain a one-dollar contribution for each of the more than 2,500 babies delivered by Dr. M. G. Flath during his 40 years of practice in Stanley. The money will be used for the furnishing of a new community hospital in recognition of Dr. Flath's service to the community. A graduate of Northwestern University medical school, Dr. Flath has practiced in Stanley since 1910.

* * *

The North Dakota regional meeting of the American College of Physicians was held at Minot, September 9, with Dr. Robert Radl of Bismarck presiding. Dr. Goehl presented a paper on kidney disease and Dr. E. A. Haunz one on diabetes.

* * *

Dr. R. D. Campbell of Grand Forks has been named honorary chairman of the St. Michael's hospital fund drive in that city. The new 200-bed hospital will be constructed on a site near the University of North Dakota campus, and will be completed in the fall of 1952.

* * *

Dr. C. C. Smith, Mandan, was appointed district health officer of the Custer District Health unit. The board, which meets quarterly, directs and approves the public health programs in Mercer, Morton, Grant and Sioux counties.

New locations and appointments . . .

Three new doctors have been added to the staff of the Grand Forks Clinic: Dr. Raymond Valler, a graduate of the University of Illinois medical school and a specialist in pathology; Dr. Arthur Rathkey, a graduate of the University of Oregon medical school and a specialist in pediatrics; and Dr. John D. Folson, a graduate of the University of Chicago medical school and a specialist in orthopedics and surgery.

* * *

Dr. I. L. Lazareck, formerly of Winnipeg, has established practice in Langdon in association with Dr. V. A. Mulligan. A graduate of the University of Manitoba medical college, Dr. Lazareck is a specialist in surgery and gynecology.

* * *

Dr. Lester Shook, who has practiced in Riverdale for the past year, will leave October 1 for Kansas City, Missouri, where he will specialize in radiology.

* * *

Dr. O. P. Erickson, formerly with the Quain & Ramstad Clinic in Bismarck, will establish an office in Turtle Lake.

* * *

Dr. R. A. Beck, formerly of Kalispell, Montana, is now associated with the Community hospital in Sharon.

* * *

Two physicians have recently joined the staff of the Quain and Ramstad clinic in Bismarck. They are Dr. M. E. Nugent, a graduate of the Rush Medical College in Chicago, and a specialist in diseases of the eye, and Dr. Robert J. Strobel, a graduate of the University of Minnesota School of Medicine and a specialist in the diseases of the eye, ear, nose and throat.

Minnesota

Mount Sinai hospital announces the appointment of three doctors to full time positions on the hospital staff: Dr. S. Steven Barron, pathologist; Dr. Jack Friedman, radiologist; and Dr. Irving Greenfield, anesthesiologist.

* * *

Dr. John M. Adams, associate professor of pediatrics at the University of Minnesota medical school, has been named chairman of the department of pediatrics at the new medical school now being organized at the University of California at Los Angeles. A graduate of Columbia University College of Physicians and Surgeons, Dr. Adams has been on the full time staff at the university since 1943.

* * *

Dr. J. Arthur Myers, chairman of the Journal-Lancet board of editors, left September 12 to deliver the first Journal-Lancet lecture at Hebrew university medical school, Jerusalem, on September 14. He later attended the first International Congress on Diseases of the Chest which opened in Rome on September 16.

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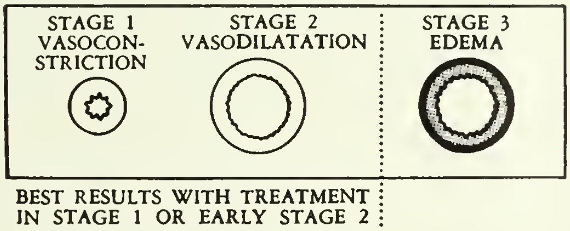
"Although E.C. 110 (CAFERGONE) was developed primarily for the relief of the migraine attack, it is uniformly effective and has a much wider range of usefulness in the relief of headache of all other types, especially typical and atypical histaminic cephalgia." (Hansel)(1)

For The First Time In Almost Two Thousand Years, clinical trials of an oral preparation indicate that migraine and other vascular headaches can be aborted in 85-90% of cases.

Although the cause of migraine is still unknown, the mechanism productive of head pain has been determined.(2) Today, it has been observed that the head pain in classical migraine and related disorders is produced through abnormal behavior of the cranial vascular system. The affected arteries, principally branches of the external carotids, become constricted in the early stage of the attack. Such vasoconstriction results in preheadache warning signs such as visual and other sensory disturbances. Later in the attack, these arteries become relaxed and dilated. *At this point, agonizing headache begins.* Exaggerated pulsations and thickening of the affected arterial walls cause stretching of and pressure upon adjacent pain-sensitive structures. Headaches of this type may last for a few minutes only or they may last for days. Seizures are usually terminated by severe vomiting.



As a result of recent research, these headaches can be aborted for the great majority of sufferers. *Attention has been centered on the development of an effective oral preparation to relieve vascular headaches. Cafergone.* (100 mg. caffeine and 1 mg. ergotamine tartrate per tablet) *is the result of this research.* Ergotamine tartrate (Gynergen) has long been known as a potent vasoconstrictor. (3, 4) Caffeine, when administered orally, also acts as a vasoconstrictor.(5) Simultaneous administration of ergotamine tartrate with caffeine in Cafergone tablets has the added advantage of reducing the usual dose of ergotamine necessary to abort these headaches.(4)

These measures will abort vascular headaches for 85-90% of sufferers:(1, 4, 6, 7)

1. Give complete physical examination including ancillary tests to rule out other conditions mimicing migraine.
2. Advise the patient to re-organize his activities where possible.
3. Improve the general health of the patient.
4. Give 2 Cafergone tablets at first sign of impending attack and, if necessary additional 1-tablet doses (up to 6) at half-hour intervals.

For Subsequent Attacks: after the total number of tablets required for a patient's attack has been determined, give that total dose all at once for any subsequent attack of equal severity suffered by that patient. (Occasionally an attack returns due to inadequate dosage having been used; in such case repeat the dose and for any later attack adjust dosage accordingly.)

Literature available on request, for further particulars on *Dosage Adjustment* and other points:

Reprints of recent reports.
Therapeutic brochures.
Chart, "Clinical Characteristics of Vascular Headaches."

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Dr. Claude J. Ehrenberg is the new president of Northwestern hospital staff. Other officers include Dr. Hewitt B. Hannah, vice president; Dr. Norman E. Rud, secretary-treasurer; Dr. Robert E. Priest, chief of surgery; Dr. Harold E. Miller, chief of medicine; Dr. William P. Sadler, chief of obstetrics and gynecology, and Dr. Donald H. Daniel, chief of general practice.

* * *

Dr. Franklin H. Top, director of the Herman Kiefer Hospital, and acting head and clinical professor of preventive medicine and public health at Wayne University College of Medicine, will become professor of epidemiology in the school of public health and professor of pediatrics at the University of Minnesota Medical School.

* * *

Dr. Harold S. Diehl, dean of medical sciences at the University of Minnesota, has been named to the new Health Resources Advisory committee of the National Security Resources board.

* * *

Dr. Evelyn E. Hartman, one-time physician with the department of baby clinics in Finland, has joined the staff of the Minneapolis city health department, where she will serve as maternal and child health physician.

* * *

Members of the Southern Minnesota Medical association held their annual meeting at Mankato on September 11. Speakers included Dr. Giles Koelsche and Dr. H. J. Svien of Rochester; Dr. W. E. Wilson of Northfield, president of the association; and Dr. Donald J. Cowling, president emeritus of Carleton College.

* * *

Dr. Charles Sheppard of Hutchinson will be featured in the November issue of the *Ladies Home Journal,* as the typical American country doctor.

* * *

Dr. M. B. Hebeisen, Chaska, has been named chief of staff of the proposed 50-bed St. Francis hospital to be located in Shakopee. A drive to raise $150,000 for the building is now under way in parts of Scott, Carver and Hennepin counties.

* * *

A public open house for the new county infirmary at Virginia was held on August 30. Dr. Paul Reed was chairman of the Chamber of Commerce committee which planned the open house.

* * *

Dr. Kenath H. Sponsel has opened an office in Minneapolis continuing the practice in orthopedic surgery of the late Dr. Vernon L. Hart. A graduate of the University of Chicago medical school, Dr. Sponsel has recently been a fellow in orthopedic surgery at the Mayo Clinic at Rochester.

South Dakota

Dr. Arthur S. Jackson of Lead, who has been engaged in the practice of medicine for 48 years, was honored by the doctors and nurses of St. Joseph's Hospital on August 22. Dr. Jackson has been in continuous practice in Lead since 1915 with the exception of one year's service with the army medical corps during World War I.

Dr. R. J. Quinn of Burke has been chosen South Dakota's general practitioner of the year. Selection was made by the council of the South Dakota Medical association.

* * *

Dr. Gerald A. Kuehn has recently joined the staff of the Delaney clinic at Mitchell as a specialist in internal medicine. Dr. Kuehn is a graduate of the University of Nebraska medical school and served his residency in internal medicine in the veterans hospitals under the supervision of the University of Kansas medical center.

* * *

Dr. Frank A. Neisius who has been practicing medicine at Angel, Oregon, will open up an office in Lead.

* * *

Dr. Hamlin Graham, a graduate of the University of Colorado medical school and a specialist in surgery, is establishing a practice in Chamberlain. Dr. Graham has served nearly seven years in the army and has just completed postgraduate work in surgery in Seattle.

* * *

Dr. George Spurbeck of Cloquet, Minnesota, a graduate of Marquette University medical school, has joined the Pierre clinic at Pierre, South Dakota.

* * *

Dr. C. D. Green, formerly of Parker, has opened an office in Canton.

* * *

Dr. R. W. McMullen of Wolfcreek, Texas, a graduate of the College of Medical Evangelists in Los Angeles, has established a practice in Parker.

* * *

Dr. Marvin Hurewitz is moving from Flandreau to Estelline, where he will join the clinic there.

A. C. H. A. News

Do you have news that might be of interest to members of the Association such as changes and additions in personnel or research projects? The purpose of this column is to keep our membership informed of activities in the field of college health. Please send news items to the secretary.

The Proceedings of the twenty-eighth annual meeting should now be in your possession. Two copies were mailed to each member institution, one to the Director of College Health Service, the other to the library. If files of past proceedings are not complete copies are available for a small fee.

With the start of the new academic year, local sections are making plans for either a fall or a spring meeting. Many significant papers of national interest are presented. In order to make these available to the whole membership, officers of local sections should send a copy of selected papers to: Charles E. Shepard, M.D., Executive Secretary, Editorial Committee, 2002 Tasso Street, Palo Alto, California. Consideration will be given to publication of papers either in the Journal-Lancet or in the next annual proceedings.

Twenty-five institutions have not yet paid dues for the year 1950. Unless payments are received promptly, the treasurer will be forced to send a third notice.

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Deaths

Dr. Mark E. Ryan, a native of Delafield, Wisconsin, and a graduate of the University of Minnesota medical school, died Wednesday, August 16. He had practiced in St. Paul since 1922.

Dr. Melvin Sanderson of Minneota, Minnesota, who served on the staff of Veteran's Administration in Minneapolis, died Saturday, July 15. He formerly practiced both in Minneota and Currie.

Dr. John Garberson of Baker, Montana, died on Wednesday, August 9. A graduate of Northwestern medical school in 1907, he came to Montana in 1908. He had practiced at Miles City for over forty years.

Dr. J. G. Vigeland, 75, North Dakota's "family doctor of the year" in 1948, died at Brinsmade, North Dakota, on August 11. He had practiced at Brinsmade for 38 years.

Dr. F. J. Brabec, 81, Perham doctor since 1893, died July 29 at St. James hospital in Perham, which he had helped to found.

Dr. K. P. Caveny, formerly of Langdon, North Dakota, died on June 5 at Portland, Oregon. A graduate of the University of Minnesota, Dr. Caveny had practiced at Langdon until 1948.

Dr. Vernon L. Hart, Minneapolis, died Wednesday, July 12. Dr. Hart, a diplomate of the American Board of Orthopedic Surgeons, served on the staffs of St. Barnabas, Swedish, Abbott, St. Mary's, Asbury and University of Minnesota hospitals in Minneapolis.

Dr. E. L. Baker of Minneapolis died Thursday, July 20. He was a member of county and state medical societies, A.M.A., Nu Sigma Nu and Alpha Omega Alpha.

Dr. Thor Moeller, of Lisbon, North Dakota, a former physician in Devils Lake, died September 3 in Fargo. A veteran of World War I, Dr. Moeller had been hospitalized in Fargo for two years.

Dr. Nimrod A. Johnson, former Minneapolis surgeon, died September 6 in Santa Monica, California. A graduate of the University of Minnesota medical school, Dr. Johnson practiced general surgery in Minneapolis and at one time was a staff member of Deaconess and St. Mary's hospitals.

Dr. Arthur H. Joistad, retired Fargo physician, died August 20 in Muskegon, Michigan, after a long illness. A graduate of the University of Minnesota medical school, Dr. Joistad was in general practice at Maddock, and later at Fairdale, North Dakota, then became an eye, ear, nose, and throat specialist at Fargo.

Dr. Charles Anthony Reed of Minneapolis died August 22. A graduate of the University of Minnesota medical school, Dr. Reed practiced as an orthopedic surgeon in Minneapolis for many years.

Notices

A continuation course in diseases of the chest will be presented at the University of Minnesota Center for Continuation Study on October 26-28, 1950. Faculty members of the course include Dr. O. A. Sander, associate in medicine, Marquette University Medical School; Dr. John H. Skavlem, president of the American Trudeau Society, and associate professor of medicine, Cincinnati University Medical School; and Dr. James J. Waring, professor and chief of medicine, University of Colorado.

A continuation course in child psychiatry for pediatricians and physicians will be presented at the Center for Continuation Study November 27 to December 1 with Dr. Ralph D. Rabinovitch and Dr. John Waterman as lecturers and group discussion leaders. Dr. Reynold A. Jensen, head of the child psychiatry service of the University of Minnesota, is in charge of the arrangements for the course.

Dr. Knut Lindblom of the Karolinska institute in Stockholm, Sweden, will give the annual Leo G. Rigler lecture in radiology at the University of Minnesota Thursday, Nov. 2. Dr. Lindblom will speak on "Backache" at 8:15 P.M. in the amphitheater of the University medical sciences building. The lecture will be given in connection with a course in neuroradiology October 30 through November 3 at the University Center for Continuation Study.

The Public Health Service is offering 122 approved one-year rotating internships in eleven of its U. S. Marine Hospitals to begin July 1, 1951. These internships are open to graduates of approved medical schools. Applications and further information may be obtained by writing to the Public Health Service, Federal Security Agency, Washington 25, D.C., Attention: Chairman, Committee on Residencies and Internships.

The Fifth American Congress on Obstetrics and Gynecology, sponsored by The American Committee on Maternal Welfare, Inc., will be held at Cincinnati, Ohio, from March 31 through April 4, 1952, with the Netherlands Plaza Hotel as the headquarters hotel.

The 1950 *annual meeting of the North Dakota Public Health Association* will be held in Fargo on November 8, 9, and 10, instead of the following week in Bismarck as previously planned.

The Omaha Mid-West Clinical Society will hold its 18th annual assembly at Hotel Paxton, Omaha, Nebraska, October 23rd to 27th, inclusive.

The American Dermatological Association is offering a prize of three hundred dollars for the best essay submitted of original work, not previously published, relative to some fundamental aspect of dermatology or syphilology. Details may be obtained by writing to Dr. Louis A. Brunsting, Secretary, American Dermatological Association, 102-110 Second Avenue, Southwest, Rochester, Minnesota.

THE MAYO MEMORIAL

(Continued from page 385)

to accomplish for oneself alone, but for each to carry his share of collective responsibility."

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The
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LANCET

NOVEMBER, 1950 Volume LXX, No. 11

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Bibliographic references should be at the end of the manuscript and not in footnotes. Each reference should include the following information in the order indicated: Name of author with initials, title of article, name of periodical, volume, page and year. Reprints are prepared on order.

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The
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Minneapolis, Minnesota
November, 1950

Vol. LXX, No. 11
New Series

The Surgeon's Approach to the Problem of Alimentary Tract Malignancy*

Including special comment upon: (1) the "second look" procedure for lymph node positive cases, (2) use of tracheotomy in aged, debilitated patients undergoing formidable abdominal operations, (3) super-radical mastectomy, and (4) a clinico-pathological classification of cancer.

Owen H. Wangensteen, M.D.†
Minneapolis, Minnesota

No one knows very much about cancer. It would be foolhardy to deny this. Were it not so, I would be even more hesitant than I am to parade my ignorance before you. There is on the horizon, however, the promise of a better day—a promise which is the reward of an awakened, broader and a keener interest.

For long years pathologists have been accumulating a vast storehouse of information on the behavior of cancers in various tissues. Their interest attracted the surgeons, who, with the aid of anesthesia, antisepsis, and asepsis, have been exploring the possibilities of curing cancer by extirpative techniques. Their own labors have taught them that, if the cancer is local without evidences of extension to adjacent lymph nodes, the incidence of cure is high. Moreover, it is becoming increasingly apparent that the onset of symptoms in a visceral cancer is often synonymous with a late cancer, because of the length of the silent interval.

It is heartening, therefore, to note the keen interest of the cancer biologist, who has been undergoing multiple stages of fission in his anxiety to encompass the ever broadening aspects of the cancer problem. Cancer has been produced experimentally and a number of carcinogens have been identified. These circumstances, together with the feverish and unrelenting searches of many varieties of cancer biologists, give promise that facts will be brought to light which will help us to understand the nature of cancer.

---

†Department of Surgery, University of Minnesota Medical School, Minneapolis 14, Minnesota.

*The work on which this presentation is based was supported by the following local sources for cancer research: (1) The Flora L. Rosenblatt Fund, (2) The Malignant Disease Fund, (3) Mr. and Mrs. R. C. Lilly Fund, (4) The Donald P. and Marion S. Ordway Fund, (5) Edna S. Benson Fund, (6) The Tillie A. Nelson Fund, and (7) The Leo and Frances Pritzker Fund.

Grateful acknowledgment also is made herein to the United States Public Health Service for its generous support of the Gastric Precursor Study and of the work in the Cancer Detection Center. The latter activity is sponsored by the Council of the Minnesota State Medical Society and receives generous support from the Minnesota Division of the American Cancer Society.

Presented before the North Dakota State Medical Society in Grand Forks, May 30, 1950, and the Montana State Medical Society in Bozeman, July 12, 1950. These same materials also were used for a lecture at the Memorial Hospital in New York, May 18, 1949, and in a Symposium on Cancer sponsored by the Detroit Institute of Cancer Research, October 16 to 18, 1950.

It is easy to ask questions of Nature which no one can answer. Every child does it. The successful investigator learns to ask, piece by piece, questions to which well-directed labors may secure an answer. An important part of the problem, therefore, is to learn to ask sequentially questions, which when answered, will shed light on others which probably occur to none of us now. It is easy to ask questions which occupy the minds of all of us, such as: What is cancer? What causes it? How may we prevent it? Are there no specific anticarcinogenic agents which will deal effectively with cancer when its presence is established? For such questions there can be no answers until we know far more than we do now of: (1) the chemistry of normal growth; (2) agencies which excite abnormal growth; and (3) cooperating agencies which may retard or accelerate abnormal growth. And for each of these questions, thousands of answers must be sought for fragments of these questions, which answers, when fitted against one another like segments of a jigsaw puzzle, will eventually give us a picture which will bring understanding into the broad topography of ignorance which still surrounds the cancer problem.

Research is the lifeline that links us to progress. But while some are addressing themselves to the formidable questions relating to the nature of cancer, some of us, who are more myopic and less imaginative, must of necessity occupy ourselves with the more immediate and practical questions relating to the recognition and management of cancer. Even the validation of the possible etiologic role of certain extrinsic agencies in the genesis of cancer requires the employment of critical experimental techniques which must be explored beyond the mere assembly of data by analysis. This is an area of experimentation in the cancer field open to the trained critical clinician as well as the simon-pure cancer biologist. It would appear that such lesser flights of the imagination might contribute a good deal to our understanding of the role of some external causes said to be operative in causing cancer. An even more productive field for study relating to the origin of cancer concerns the morphologic and functional changes in some tissues which antedate the beginnings of cancer. These end effects may be either extrinsic or intrinsic in origin. And a better understanding of agencies which may increase the local tissue susceptibility to cancer is much needed.

FREQUENCY OF CANCER

Since the turn of the century, a great change has come about in the complexion of causes of death in this country. Infectious diseases such as pneumonia, infantile diarrheas, and tuberculosis have assumed far less important roles as agencies of death than they once occupied. Degenerative diseases of the blood vessels and cancer are now the most frequent causes of death. If research should teach us methods of bringing these two diseases under control, one might ask with justified concern: How old may men live to be? Was not man driven out of the Garden of Eden after he had eaten of the tree of knowledge "lest he put forth his hand and take also of the tree of life, and eat, and live forever"? There is little disposition on the part of almost all men to live beyond their period of usefulness; when man is no longer self-sufficient and becomes dependent upon others for his daily wants and care—then it is time, most men will agree, to mingle one's bones with the dust.

Yet, cancer is depriving a large number of persons of useful life. There is a sharp rise in cancer mortality in both sexes at age 45. With added years, the cancer death rate ascends steeply. Society's concern and that of the medical profession is with the loss of lives from cancer in the full bloom of maturity, when years and experience have beaten and tempered knowledge into wisdom, and the satisfying ears of fruitful and promised productivity and accomplishment lie directly ahead. And when the fever of life is past, most of us view with anticipation a short span of contemplative years, the twilight of life, when one can look forward without fear and backward with grateful satisfaction much in the manner that we view a beautiful sunset; and during the brief moment of afterglow of a dying sun, the memory is easily stirred to peaceful meditation upon pleasant things. Such can be the happy ending of a day. May this too, someday be the manner in which man takes leave of life! Cancer deprives too many men and women of such a prospect.

THE FREQUENT CANCERS

One of the most frequent of cancers occurs on the skin, below the wristline and above the neck line, where they may be seen; fortunately, the mortality from that cancer is consequently relatively low. This occurrence is accounted for in two circumstances: a blemish visible to others persuades its owner more readily of the necessity of treatment than one which is known only to its bearer; and cancers of the skin, one may rightfully infer, are potentially less hazardous than visceral cancers.

In the female, cancer of the breast, uterus (cervix), colon and rectum (considered as one organ), and the stomach take the largest toll of life. After age 65 in women, cancer of the stomach takes a larger toll than any other cancer. In the male, the most lethal cancers are stomach, colon and rectum, and prostate. After age 70 in men, cancer of the prostate takes a larger toll of life than any other cancer. In the female, cancer of the genital system of organs (including the breast) destroys most lives, followed closely by cancers of the alimentary tract. In the male, cancers of the alimentary tract head the list, trailed by cancers of the genital and respiratory system of organs.

ALIMENTARY TRACT CANCER

Cancer is observed in the alimentary tract from the lips to the anus. The lips, mouth, pharynx, esophagus, stomach, colon and the rectum are the usual sites—the small intestine, considering its great length, is a rather unusual site of cancer. The ultraviolet radiations of sunlight, together with the effects of exposure to wind, are believed to be the cause of lip cancer. The causes of all the others are unknown.

Cancer of the alimentary tract is frequent in both the sexes. Cancer of the lip is predominantly a male cancer. Whether it will remain so, with more general participation in outdoor activities by women, including sunbathing, remains to be seen. Cancer of the esophagus is notably a disease of males, there being approximately five such cancers for each one observed in the female—and this despite the circumstance that cancer of the hypopharynx is largely a cancer of women. Sideropenia and the Plummer-Vinson syndrome of dysphagia frequently are antecedents. The nature of the increased tissue susceptibility through these agencies remains obscure. Cancer of the stomach occurs more frequently in the male; yet after age 65 it causes more deaths than any other cancer in the female. Cancer of the colon and rectum, considered as components of the same organ, is apparently somewhat more frequent in the female than the male. Moreover, cancer of the colon and rectum becomes frequent at an earlier age than cancer of the stomach in both males and females.

Tissue Susceptibility to Cancer

We know virtually nothing concerning why cancer has a predilection for certain organs. In the mouse, certain genetic tissue susceptibilities are far more striking than in man. Whereas in man these are multiple, in certain strains of mice, the predilection is for a certain organ. Breast cancer in certain strains of female mice is probably the best example. Although it was once believed that its occurrence in the mouse was solely a genetic influence, it is now well known that a number of factors affect the frequency of incidence. The influence is transmitted through the milk (Bittner's milk factor). Early castration stops the transmission, as does caloric restriction of food intake, a circumstance which apparently is also mediated through the ovary. There are probably other factors, still unknown, which influence the occurrence of this cancer. If the breasts were excised in newborn female mice, with the predisposition of this particular organ for cancer, would that influence manifest itself in some other organ? We do not know. We should know. If in the human female, the breasts and cervix were excised in a group of women, would there be more cancer in other organs such as the alimentary tract? Or would the incidence of cancer in those organs be unaffected? These are questions of more than academic import.

Local Precursors of Alimentary Tract Malignancy

Achlorhydria and gastric cancer:

For cancer of the mouth and the lower reaches of the esophagus, no definite systemic or local precursors are known. For both, one hears syphilis mentioned occasionally, but the extent of the association is not too well authenticated. The ingestion of strong liquors has been cited as a contributing factor in the development of esophageal cancer. Leukoplakia, admittedly, precedes some oral as well as esophageal cancer. Nothing is known concerning the causes of gastric cancer, but that achlorhydria exerts a predisposing influence is becoming increasingly evident. Achlorhydria is probably the best screening test available to indicate what groups of patients should be subjected to roentgen study of the stomach with a view to excluding the possibility of gastric cancer. Moreover, a study of a large group of achlorhydric patients is likely to uncover some patients with gastric polyps, a condition which is definitely a precursor of gastric cancer. Gastric polyps of two cms. or more in diameter are usually malignant. The longer a group of achlorhydric patients is examined, the greater will be the incidence of gastric cancer. In other words, among a group of patients who have been known to be achlorhydric over a period of years, more gastric cancers will be found than in a group observed for a shorter period and in which the duration of the achlorhydria is unknown. Achlorhydria is a regular concomitant of pernicious anemia as well as gastric polyps; and that gastric cancer is observed more commonly in both these groups than among patients of the same age not having either of these conditions is well known.

What is the chain of circumstances which leads to achlorhydria? Are they always the same? No one knows. Unfortunately achlorhydria accompanied by permanent parietal cell atrophy cannot be produced experimentally.

Relation of colic and rectal polyps to cancer:

In colic and rectal cancer, a polyp is *the* frequent precursor. In fact, it is likely that the majority of colic and rectal cancers originate in a polyp. This frequent relationship does not hold for gastric polyps and cancer. Moreover, it is not unlikely that rectal and colic polyps are "quicker" precursors; that is, the time interval, between observance of the polyp and the supervention of cancer, is probably not as long in colic as in the gastric polyp to cancer transformation. Furthermore, a large number of patients over 45 years of age in both sexes subjected to proctoscopic examination of the rectum appear to have polyps. In the Cancer Detection Center, Dr. David State and his associates have been proctoscoping all patients without symptoms past the age of 45 years who are accepted for examination. All patients having occult blood in the stool, or in whom polyps are observed on protoscopic examination, are subjected to an air-contrast study of the colon with barium. If a condition described by protologists as adenoma of the rectum is included, adenomas or polyps of the rectum or polyps of the colon were observed in approximately ten per cent of the patients examined in the Cancer Detection Center.

It obviously would lessen the arduous labors of cancer detection, if it were possible to delineate other features which would help to indicate what patients may develop malignancy of the alimentary tract.

Silent Interval

Unfortunately, however, the silent interval in cancer of the alimentary tract is long. It would appear that, in gastric cancer, this interval is approximately 20 months. Moreover, a lesser length of time in addition is lost after symptoms occur before patients seek treatment. It would probably be in accord with the fact to suggest that most alimentary tract cancers are approximately of two years' duration when the patient comes for treatment. This is not a happy circumstance. Only the examination of symptomless patients will lead to betterment of this lamentable situation. There is no way to detect consistently the presence of cancer in the alimentary tract today in its early phases without arduous labor. The finding of more screening tests such as achlorhydria, occult blood in the stool, rectal and proctoscopic examinations and anemia, all of which can be carried out in the offices of competent general practitioners, would be very helpful. A trend toward the development of such additional screening tests would simplify the problem of finding patients who are harboring a silent cancer in their alimentary tract.

SURGERY

One of the great advances in surgery during the past decade has been the development of satisfactory procedures for the extirpation of cancer of the esophagus. And strangely enough the techniques are not so unlike methods tried previously; the real difference being that, whereas earlier such efforts ended disastrously, quite uniformly now, in practiced hands, these operations can be done with a reasonable mortality. Moreover, it is not unlikely that in the foreseeable future, cancer of the esophagus can be managed surgically with mortalities not out of line with those considered standard for cancer of the stomach. Moreover, in gastric cancer too, surgical mortalities have declined steadily despite the fact that surgeons have been extending steadily their criteria of operability and resectability. And so similarly with colic and rectal cancer. This great improvement in the immediate result of operation for alimentary tract cancer has come about through smaller improvements in a number of areas, notably the following: better anesthesia, improved postoperative management of the patient, better nutritional preparation of the patient, more precise surgical techniques, executed with deliberate and studied care, adequate replacement of blood loss and the elimination of the element of hurry. These factors in the hands of trained and practiced surgeons have brought about an entirely new conception of how well poor risk patients may tolerate formidable operations. Our great need now is to have patients come while the disease is still local. Only that eventuality will bring about a similar improvement in the late survival of patients after operation for cancer of the alimentary tract.

ESOPHAGUS

Save for the circumstance that a few clinics are endeavoring to treat cancer of the esophagus by means of x-ray irradiation, it can be said quite categorically: the only satisfactory treatment of cancer of the digestive tract beyond the pharynx is surgery.

All phases of the operation for esophageal cancer have been quite well standardized save for cancer of the cervical esophagus; yet, in many clinics, surgeons now are making aggressive attacks upon hypopharyngeal cancers with remarkable success. In cancer of the thoracic esophagus, there is still no general agreement as to whether the incision should be made on the right or left side, but the techniques are otherwise the same; displacement of the stomach into the thorax makes it possible for the surgeon to replace long reaches of excised esophagus.

STOMACH

All surgeons now are doing more complete operations for gastric cancer than those performed ten years ago. The removal of the entire potential lymphatic drainage area is essential, which of necessity includes the entire greater omentum and the gastrohepatic omentum to the left of the common bile duct and the vascular pedicle of the liver.

Complete gastrectomy can now be done, with no great increase in risk over that of subtotal gastric resection, and should be carried out together with excision of several centimeters of the esophagus and the duodenum in all diffuse gastric cancers. The old myth of "pyloric block" with reference to extension of gastric cancer into the duodenum appears to have been exploded. By cutting the crura of the diaphragm, the diaphragmatic canal is converted into a hiatus, making access to the esophagus more simple. Moreover, employment of an upper midline incision combined with a median sternotomy incision extending up and into the fourth or fifth left intercostal space facilitates considerably the ease of removal of a long length of esophagus in total gastrectomy.

A deliberate search for and removal of lymph nodes is carried out: in the subpyloric area, near the lower margin of the pancreas; from the suprapyloric area in the vicinity of the suspensory structures in the extreme right end of the gastrohepatic omentum up to the esophagus. Removal of all lymphatic tissue from the celiac axis is carried out including that along the superior border of the pancreas and all mesenteric tissue covering the upper end of the lesser curvature and the subdiaphragmatic esophagus. Moreover, it is necessary to excise the peritoneum overlying the subdiaphragmatic esophagus, as well as the lymph node bearing tissue along the esophagus. The spleen is now removed routinely in all operations for gastric cancer. Even in pyloric cancers the spleen must be removed to permit removal of the lymph nodes in the gastrosplenic omentum. In addition, removal of the spleen makes it feasible to effect a better lymph node removal along the superior border of the pancreas. In patients, in which gross evidence of involvement of the nodes in the splenic hilum or about the tail of the pancreas is detectable at operation, sacrifice of the distal one-third or more of the pancreas is in order.

In this clinic all resections in the alimentary tract, including gastric resections are made by the closed technique; the only exception is in anastomoses made with the esophagus owing to the circumstance that the esophageal mucosa not infrequently retracts when the esophagus is divided. An open anastomosis is necessary to grasp the mucosa in the suture, thus avoiding stricture formation.

Whereas most excisional operations for gastric cancer throughout the world have been done by some variant of the Billroth II method, granted it can be effected satisfactorily, restitution of continuity by the Billroth I method would leave the patient with a better physiologic arrangement with reference to the important item of interaction of the digestive secretions upon ingested food. Moreover, after total excision of the stomach, the insertion of an isoperistaltic segment of jejunum or transverse colon between esophagus and duodenum might make it easier for the patient to support the loss of his gastric reservoir. Unlike patients with peptic ulcer, the larger number of patients with gastric cancer are achlorhydric, and in consequence the digestive function of the stomach has already largely been lost, when the patient comes for excision of the cancer. Conversely, the patient who undergoes gastric resection for ulcer loses simultaneously both the digestive and reservoir functions of the stomach. It is understandable, therefore, that most patients undergoing gastric resection for cancer appear to effect a satisfactory adjustment to the loss more quickly than do patients having the same operation for ulcer.

Colon and Rectum

The one stage closed resection without preoperative oral administration of antibiotics is the standard operation for all unobstructed cancers of the colon in this clinic. Only those who are committed to the open anastomosis find it necessary to employ antibiotic therapy prior to operation. The exteriorization operation of Bloch, Paul and Mikulicz has been given up by practically all surgeons. It has not been performed in this clinic during the past ten years. A studied effort to encompass the entire lymphatic drainage area in the excision is in order. Moreover, it is not unusual in excising long lengths of the colon to encounter an unexpected polyp far removed from the lesion for which the operation was undertaken. This circumstance has persuaded the writer that excision of the entire proximally lying colon is justified in all cancers of the sigmoid. In fact, I regard subtotal excision of the colon as the procedure of choice in all cancers lying beyond the hepatic flexure and above the sacral promontory. Intestinal continuity can be effected by uniting the ileum end to end with the iliac colon just beneath the sacral promontory. Persistent diarrhea is unusual. It is excision of the terminal 25 to 40 cm. of the ileum, together with the right half of the colon in cecal cancer, which causes loss of the water wringer of the bowel, thereby promoting diarrhea. Consequently, primary subtotal excision of the colon is not a good operation for cancer of the cecum. Yet, even in such patients, with the development of another cancer in the remaining left half of the colon, I have excised the greater portion of the remaining colon at the next operation in preference to another regional resection.

Rectal cancer:

Complete removal of the lymphatic drainage area is mandatory in all cancers save in basal cancers of the skin. Hence, even for Dukes' group A lesions, the abdominoperineal operation is to be preferred to resection in all low-lying cancers. Whereas, it is technically feasible to carry out a resection with full preservation of sphincteric fecal continence and of the sexual function, ordinarily in the male, with re-establishment of continuity at levels so low as four or five cm. from the anus, I have come to abandon all efforts at sphincter-saving operations, save in lesions which are more than eight cm. from the anus. In the presence of bulky, fixed lesions, it is probably better to raise that lower limit for resection an additional two cm. In the more conservative operation, the local lesion can be excised satisfactorily, but in low-lying lesions, such an operation removes the lymphatic drainage area incompletely.

Pre and postoperative care:

Any patient who has lost 15 to 20 per cent or more of his weight during a period of two months or less prior to surgery demands special attention with reference to protein, carbohydrate and vitamin intake prior to surgery. Any suggestion of anemia needs correction by transfusion of blood. The possibility of existence of dehydration and/or electrolyte imbalance, or disturbances in the acid-base balance of the blood needs careful scrutiny in all patients in whom a formidable operative procedure is contemplated.

The determination of a preoperative base-line of weight by repeated weighing of the patient before operation is a matter of routine in this clinic. Moreover, the weights of all patients undergoing radical surgery is determined daily during the early postoperative period. Any fluctuation of weight, gain or loss, as calculated from the preoperative base-line of more than three per cent is potentially hazardous. A desirable output of urine should be in the area of 1000 to 1500 cc. daily. All surgeons are sensitive over the occurrence of oliguria. If the patient's weight is more than three per cent over the preoperative baseline, fluids have to be administered sparingly. Even more difficult in such patients is determination of the electrolyte needs. Only periodic determination of the values for plasma chlorides and CO_2 will suggest what the electrolyte needs of the patient are. And not infrequently ascertainment of the serum values for Na and K must be done for the additional orientation provided thereby. This is a phase of the surgeon's activity which he cannot afford to neglect. In this clinic, the application of suction to an indwelling duodenal tube is routine practice in all abdominal operations. Its use is an important aid in the avoidance of distention.

Tracheotomy:

There is one item, in the postoperative care of aged, debilitated patients undergoing formidable operations upon the alimentary tract which has been added during the past year, which I feel has real merit: I refer to employment of tracheotomy during the postoperative period on *slight* provocation. It has proved a life saving procedure in many an old patient, too ill or weak to cough. When the patient has a tracheotomy tube in place, the special nurse in constant attendance becomes a better guardian of the patient's safety than the most expert bronchoscopist on the staff. She can "bronchoscope" the patient repeatedly and with little inconvenience to the patient. This is a postoperative measure which should find wider adoption by surgeons in all patients who have retained secretions in their trachea or bronchi.

RE-ENTRY OF THE ABDOMEN IN DUKES' GROUP C CASES: "NEED FOR A SECOND LOOK"

Over a period of more than a year, my associates and I have been exploring the thesis that Group C cases (patients with lymph node involvement) should be re-operated upon after an interval of four to six months. We have now explored several such patients, largely patients with colic, rectal or gastric cancer. We are persuaded that this is a worth-while endeavor. The disparity in accomplishment between group A and C cases is such in all cancers that, it is quite natural to believe that, re-exploration of patients having a group C lesion may improve the result in such cases. Our observation has been that the recurrent cancer is found most frequently in the peri-aortic lymph nodes. We have explored a few symptomless patients who initially had group C lesions as many as three times. We are hopeful that we may be able to increase the cure rate in some group C cases by this rather aggressive attitude. Most patients see the reasonableness of the suggestion and accept re-exploration without much opposition. Of course, we always tell patients when we find they have cancer. Not to do so is pre-Victorian. Sincerity is something a patient can appreciate in his physician. Re-exploration has been negative in most patients who initially presented involvement of only a few of the excised lymph nodes. Three extensive B lesions have been re-explored but apparently all the cancer was excised at the first operation. If experience justifies this need of a second look into patients who have been operated upon for cancer and in whom lymph nodes were found involved, it is obvious that this activity will add to the labors of the surgeon and create a demand for more surgical beds in hospitals devoted to the care of cancer patients.

MORE RADICAL OPERATIONS FOR FIXED LESIONS

The present trend among aggressive cancer surgeons is extension of the possible. New meaning has been synthesized out of old knowledge and this consolidation of information has extended the range of the surgeon's endeavors, making it possible for him to accomplish, with fairly consistent regularity, feats which, a few years back, were looked upon as impossible. While on the one hand we are hoping fervently to receive patients for operation who have early cancer, we must at the same time be realistic enough not to neglect the patient with advanced cancer, particularly the patient with a lesion fixed to adjacent structures. Operations of this character whether upon the stomach with invasion of the colon or pancreas, or upon the rectum with pelvic extension—none of these situations will deter the aggressive cancer surgeon from assessing the problem with the greatest care. And more frequently than not, he finds sufficient justification for embarking upon the ordeal. Cancer plaques, constituted in part by lymph nodes, intimately adherent to large blood vessels dissuades many a surgeon from an attempt to remove the tumor. It is surprising, however, what diligent effort can do in loosening up some of these adherent neoplasms.

One of the real challenges in this area of endeavor are those pelvic cancers, whether of the rectum or other pelvic viscera, which invade the base of the bladder. Certain cancers of the prostate too justifiably come within this province. Obviously radical surgery in these latter instances necessitates excision of the bladder and transplantation of the ureters. And if colostomy too has to be performed, the great trials to which the patient is of necessity subjected raises the issue of how far one is justified in going in an attempt to eradicate cancer. These latter considerations are not pleasant prospects for either the patient or the surgeon. Yet, when the patient is provided with a proper prosthesis, he appears to be able to endure the heavy burden of this cross without bitterness.

HEPATIC METASTASES

Over a period of several years in this clinic, we have been excising hepatic metastases when the situation appeared to warrant it. During the past few years, an even more radical attitude has been taken toward large localized hepatic metastases. Several excisions of large segments of the liver have now been done. The left lobe of the liver has been excised many times. Large segments of the right lobe have been removed. I have removed the entire right lobe successfully in one patient. The primary problem in most instances of hepatic removal is not essentially one of hemostasis but rather of biliary fistula which results. If complete external diversion of the leaking bile can be provided, temporary biliary fistula *per se* affords no problem, other than prolongation of the hospital stay. When large segments of the right lobe of the liver are removed, much blood would be lost if interrupted compression of the hepatic vascular pedicle were not done. Direct extension of cancer into the liver from the hepatic flexure of the colon or the stomach obviously holds a far less serious threat to life than does hepatic metastasis. Two patients in our clinic are well several years after subtotal excision of the left lobe of the liver, performed at the time of gastric resection for cancer because of direct extension. One patient in whom hepatic excision was undertaken because of metastases has been found to be negative on re-exploration for a second look at the liver after the elapse of six months following the hepatic resection.

EXTENSIVE PERITONECTOMY

Ovarian cancer and some colic cancers appear to spread widely upon the parietal peritoneum. When similar involvement of the visceral peritoneum covering the small bowel is absent, there is nothing to deter the surgeon from excising extensive segments of parietal peritoneum invaded by cancer. A rather extensive experience with attempts at removal of this type of cancer going back to 1944 has persuaded me that the peritoneum serves as a restrictive membrane to the spread of cancer. Extensive peritonectomies are therefore justified. In patients with colic or ovarian cancer presenting such evidences of spread, I have in several instances excised large segments of peritoneum, including that of a good portion of the anterior abdominal wall, the lower half of the posterior parietal peritoneum, the lateral gutter and the peritoneum over both diaphragms. The median sternotomy incision mentioned above facilitates the removal of the peritoneum below the right diaphragm. Such operations are obviously essentially palliative; however, I have the impression that repeated operations, because of the very incomplete nature of the first operation in such patients, may accomplish something worthwhile.

It is obvious that, no matter how aggressive some of these efforts are, ordinarily only palliation usually can be expected. It remains to be seen whether complete cure can be effected in patients with diffuse peritoneal spread of their lesion. Moreover, the immediate operative mortality, despite observance of the greatest care, will exceed that assumed in operating upon substandard risk patients under otherwise conventional indications for operation. Yet, from long personal experience with such ventures in cancer surgery, I am persuaded that these endeavors are worth pursuing. Yes, it would be nice to accomplish all this by the injection of a chemotherapeutic agent. And perhaps some day we will. Hope sustains and comforts us every day. It has an intoxicating effect upon minds long accustomed to despair. It may elevate us into a euphoric reverie, which when broken by waking reality, reminds us again that hope is often the last refuge of the discouraged. Palliation by nonoperative means is largely nonexistent for most abdominal cancers.

Extension of the Halsted operation for cancer of the breast:

There are probably many areas in which extension of conventional operations for cancer will improve the result. We are all aware of the unhappy manner in which involvement of the axillary lymph nodes affects prognosis unfavorably in breast cancer. And yet, many surgeons are advising contraction of indications for operation, rather than extension. In patients who present clinical evidences of axillary involvement, my colleagues and I have extended the operation to include a routine supraclavicular dissection; bilateral excision of the internal mammary chain of lymph nodes, together with a mediastinal dissection. Interestingly enough, cancer involvement beyond the reach of the conventional Halsted operation has been found in 60 per cent of patients submitted to this type of operative procedure.

The operation is carried out with an oblique type of Stewart incision slanting upward toward the axilla. If the axillary lymph nodes are found involved, a median sternotomy is done, the upper end of the incision beginning in the neck on the involved side and extending down over the sternum. The skin incision does not connect at its lower end with the oblique incision through which the breast was encised, a short bridge remaining. The sternum is divided transversely into the fourth intercostal space. A liberal segment of the first rib is removed, the clavicle is swung outward, permitting ready removal of the lymph nodes in the supraclavicular area, removal of both parasternal lymph node chains along the mammary vessels as well as of the lymph node bearing tissue in the superior mediastinum.

One of the important decisions to be made by the surgeon in all breast cancers is whether an effort should be directed at achieving a cure. Whereas palliative methods such as irradiation, estrogen or androgen treatment do prolong life in many late cases in which surgery can offer nothing, it is to be remembered that such treatment carries no promise of cure. Surgeons will do well to weigh the possibility of whether more radical lymph node extirpations will extend the hope of cure to some patients who otherwise must accept only palliative measures.

I have the feeling that we should, more often than we do, sacrifice the remaining breast when a patient comes to us because of an obvious cancer in one breast. Following this practice, when the patient accepts it, during the past year in this clinic three such undetected cancers were found in the opposite breast. My colleague, Dr. T. Brannon Hubbard, is pursuing this inquiry.

Up until now, the impact of research has been entirely on palliation. Such too has been the history of the contributions of surgery to the management of cancer. The advances of the last few years, when viewed in the light of the accomplishment of 70 years ago, are no less than phenomenal. And now surgeons are hopeful of effecting a cure in increasing numbers of patients with many types of cancer.

Suggestion of a New and More Comprehensive Clinicopathological Classification of Cancer

The Borrmann classification for gastric cancer relates essentially only to the extent of the lesion. It gives no information concerning penetration of the lesion from the mucosa to the surface, nor concerning lymph node involvement. Dukes' classification of rectal cancer concerns only the matter of penetration and the status of the lymph nodes, no information being available in the Dukes' A, B, and C ratings of the size of the tumor. By adding the extra letter D to indicate spread of the tumor to other organs such as liver, lung, and bone, and using numbers (1, 2, 3, and 4) to indicate in A the size of the tumor; in B, the extent of the penetration; in C, the extent of the lymph node involvement; and in D, if any, the invasion of other organs by the employment of such a scheme, and the simultaneous use of a diagram of the organ concerned, a fairly succinct, yet comprehensive summary of most of the important gross features of a given tumor readily could be recorded; such a record would convey a fairly intelligible statement to another (Figure I).

One of the laments of medical students concerning their studies of malignancy is the lack of uniformity of classification. It would appear that almost everyone working with data pertaining to the pathology of cancer has found it necessary to devise a classification to meet his particular needs. Certainly, there is great need for more uniform methods of classification of cancers, useful to both clinicians and pathologists.

There appears to be far less concern now, over fitting the histological features of neoplasm into the classification of its gross features, than there was earlier, when Broders (1920) with his studies of cancer of the lip, lent considerable impetus to applying histological grading to

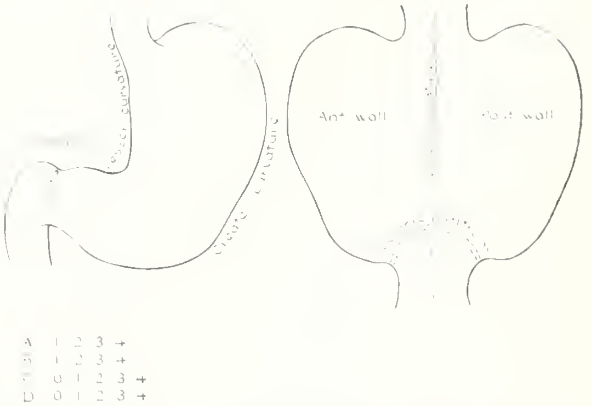

Fig. 1. A suggested clinico-pathological classification for cancer. The size A, extent of penetration B, the extent, if any, of lymph node involvement C, and extent of metastases, if any, to liver (li), lung (lu), or bone (b) can readily be indicated on the chart.

In this clinic, for frequent cancers such as stomach, colon, rectum and breast, such schematic drawings are employed, upon which a sketch of the neoplasm is made for the record.

all cancers, as being the best index of the inherent malignancy of the neoplasm. To be certain, no scheme of classifying cancers is complete without some additional help from a microscopic study. Even in the matter of lymph node involvement, the gross examination is incomplete and unreliable, save in those instances in which a portion or all of the lymph node is replaced completely by tumor. Moreover, as the serial section studies of lymph nodes by Andreason and Dahl Iverson (1949) of Copenhagen (Rigshospialet) and of Saphir (1948) of Chicago (Michael Reese) have shown in breast carcinoma a microscopic report of no involvement, by the usual method employed in most hospital laboratories of cutting one or two sections from each lymph node, is also unreliable. In Saphir's study, an average of 332 sections were cut per lymph node, every other section being stained. In 30 patients with breast cancer, in which the axillary lymph nodes were "negative" for cancer, by the usual method of hospital study, Saphir found on serial section study that in ten patients (33 per cent) microscopic evidence of cancer was found. The significance of those findings is obvious; the enormity of the labor involved is also apparent. Yet, this sampling type of study should be undertaken for every malignancy to afford better criteria upon which more reliable judgments may be expressed with reference to the important question of absence or presence of microscopic cancer deposits in the lymph nodes.

These studies have great import for the surgeon. In all cancers which may metastasize to lymph nodes, complete excision of the regional lymphatic drainage area obviously is mandatory. In so-called primary local cancers, without ostensible lymph involvement, the presence of *undetected* microscopic cancer in lymph nodes *not* removed is, in all likelihood, in large measure responsible for the circumstance that the operation fails to cure 100 per cent of such tumors. Surgeons, therefore, need to give heed and considered thought to extending their operative attacks on cancer to include excision of *all* the potential lymphatic drainage area of the organ involved.

VENOUS METASTASES

When invasion of blood vessels occurs, the success of the surgeon's attack upon cancer becomes even more restricted. In fact, up until within the past few years, its occurrence has been looked upon as the indication of utter futility of further treatment. Yet surgeons have been removing isolated pulmonary metastases long years after excision of a hypernephroma or after amputation of an extremity for osteogenic sarcoma, and in some instances with success. Of the 25 per cent of patients who fail to survive five years following operations for Stage I or Group A cancers, primary venous invasion and metastases may account for some of these. Yet inadequate lymph node removal at the first procedure is undoubtedly responsible for some. In other words, there are fewer Stage I and Group A cases than we think; some labeled as such are undoubtedly Stage II or Group C cases. The surgeon's experience with re-establishment of intestinal continuity following excision of low lying Group A rectal cancers suggests this definitely. Excision of the *entire lymphatic drainage area* is as necessary as the excision of the cancer.

Moreover, it is doubtful whether in the routine management of cancer, even with the best of appointments and a large and strong hospital staff, surgeons can reasonably expect pathologists to study specimens with the care necessary to provide ready and final answers to such questions as: Is it a Group A or C case? Is venous invasion absent?

It probably would be fair to suggest that more surgeons should help pathologists in various areas of cancer to provide, by careful survey studies, more exact information relative to the character of the lesion, the number of lymph nodes in cleared specimens, the number of nodes which exhibit microscopic evidences of invasion in any part of the node, as well as careful scrutiny of whether the tumor exhibits evidences of venous invasion. It is very unlikely in the years which lie immediately ahead—even in hospitals with strong staffs—that this gigantic task can be performed as a service to every patient submitted to operation for cancer. It should be done in every teaching hospital, in a group of representative organ removals, because it instructs everyone in the uncertainty of judgments based upon inadequate information.

However, there are probably a few malignancies in which the surgeon should take a bolder view toward the problem of venous invasion. In certain malignancies, massive venous invasion may occur, notably in hypernephroma. Surgeons can pluck an extension out of the renal vein; but a more deliberate approach, excising every vestige of renal capsule, including careful inspection of the vena cava over a long length, necessitating more frequent use of the intraperitoneal approach will result in more cures. The vena cava must be opened in some patients with satisfactory provision for the contingency of dealing with thrombi extending well up into proximal reaches of that vein.

Phemister (1930) reported pulling venous extensions out of the femoral vein in a patient with a chondrosarcoma of the femur. Fry and Shattock (1926) report the occurrence of a tumor thrombus extending through the venous system from the point of origin of a sarcoma of the sacrum, through the vena cava, right heart and pulmonary artery. The fatal thrombus, which was not recent, was 53 cm. long and 5.5 cm. thick. Is massive venous embolism responsible for the large snowball-like metastases seen in the lung, frequently long months after excision of an osteogenic sarcoma of an extremity? Or did the pulmonary metastases grow from fine small diffuse intracapillary pulmonary seeding? This is a problem with more than academic importance. If massive venous extensions are occurring, surgeons obviously must not neglect the opportunity to examine the veins of the extremity at the time of amputation. This too may be an area in which pathologist, surgeon, and radiologist may combine their efforts for the improvement of a very discouraging situation.

Summary

Cancer is a problem of the public health. Progress reflected in a greater accomplishment is being made. Anyone who has any acquaintance with cancer in its broad aspects must confess, however, to a feeling of confused bewilderment before the enormity of the problem. Many series of questions for which answers can be found must be asked of Nature and put to study and experiment, before our understanding of what cancer is will be more intelligible.

There is however no reason to despair, granted we face the problem squarely. There are prophets of doom within our own midst who suggest that "Cancer may be a way of life." Yes, it may, if we do not seek out silent cancer carriers. There is good evidence to suggest that many visceral cancers are probably of two years' duration when the patient reports to his physician because of symptoms. This occurrence suggests the necessity of supporting well-staffed Cancer Detection Centers; moreover, the elaboration of screening tests, which can be used in the physician's office to suggest which patients should be submitted to more careful study will lessen the arduous labors of such detection centers. Every physician must come to look upon himself as playing an important role in cancer detection in his own office, and when it is found that a patient has cancer, he must be told. It is absurd to withhold that information from him. An alerted patient is a cooperative patient.

The clinical approach to the problem must be twofold: (1) great emphasis needs to be lent the problem of detecting the early case; and (2) an even more aggressive attitude should be cultivated by the surgeon in his attack upon cancer. The performance of complete operations excising the entire regional lymphatic drainage area is mandatory. Fixed group B lesions, in the main, if the surgeon can remove them completely, have a favorable outlook. It is lymph node involvement by cancer which most frequently defeats the surgeon. Reoperation, or a "second look" in many group C cases after the lapse of four to six months is in order to determine whether any residual cancer remains. This practice, if adopted by surgeons, may narrow down the great disparity in accomplishment now existing between Group A and C cases. It too, like cancer detection during the long silent interval, is an effort which involves much labor. Massive venous invasion, too, is a restricted area in which the surgeon, by occasional bold efforts may be able to add brighter prospects to a dismal outlook.

It would be very nice to accomplish all this by lesser means. And it is to be hoped, when better comprehension of the problem is at hand, that we may. A surgeon has been described as a manual laborer in a Greek dress. If he with the aid of helpful colleagues in related fields, only will persist in his endeavors considerable encouragement may be lent potential and actual cancer sufferers. Honest toil is an honorable pursuit, especially when it is directed at making the lives of men longer and happier. While we entertain our minds with thoughts of hope and simpler methods of treating cancer, let us press on. Surgery offers many cancer sufferers hopeful prospects of cure.

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(Continued on page 450)

Significance of Tumors of the Neck*

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Tumors in the cervical region, which manifest themselves by displacing normal surrounding tissue in the plane of least resistance, are diagnosed correctly preoperatively in direct proportion to the care taken in the physical examination and in evaluating the history of both local and general symptoms. The objective of the surgeon is not only to estimate what condition may exist and, by weighing all factors, to determine whether it is surgical, but also, if it is surgical, to recognize the optimal time for surgical intervention.

Although the causes of cervical swellings are numerous and must be differentiated, the chief concern of this discussion is the question of inflammatory or malignant involvement of lymph nodes. If the swelling is assumed to be inflammatory, is it a manifestation of a systemic disease, is it secondary to a focus of infection in the head or neck, and how long is one justified in waiting before performing biopsy of a node? If malignant involvement is present, is it a manifestation of a primary malignant lesion of the lymphatic system, is it metastatic from a distant primary growth, or is it metastatic from a nearby primary carcinoma for which dissection of the cervical lymph nodes is indicated? The answers often are not simple and must be based on complete evaluation of the individual case.

Table I

Summary of Cases Included in Present Study

Lesion	Number	Pct.
Malignant neoplasm	304	100.0
Metastatic carcinoma	153	50.3
Primary lesion above clavicles	76	
Primary lesion below clavicles	52	
Primary lesion not proved		
Upper cervical nodes	5	
Lower cervical nodes	20	
Lymphoblastoma	69	22.7
Primary malignant tumor	82	27.0
Parotid adenocarcinoma	72	
Submaxillary adenocarcinoma	7	
Carotid body tumor	2	
Fibrosarcoma	1	
Benign conditions	305	100.0
Benign growth	162	100.0
Keratoma	35	21.6
Lipoma	31	19.1
Thyroglossal duct cyst	30	18.5
Parathyroid tumor	17	10.5
Branchial cleft cyst	13	8.0
Adenocystoma lymphomatosum	6	3.7
Neurofibroma	5	3.1
Miscellaneous	25	15.5
Inflammatory condition		
Lymph node	110	100.0
Nonspecific inflammation	79	71.8
Tuberculosis	21	19.1
Boeck's sarcoid	8	7.3
Granuloma	2	1.8
Inflammatory lesion	21	100.0
Inflammatory mass	11	52.4
Abscess	10	47.6
Sialadenitis	12	100.0
Submaxillary	9	75.0
Parotid	3	25.0
Total lesions	609	

Survey of Cervical Swellings

A survey was made of the cases in which cervical conditions were treated surgically at the Mayo Clinic during the year 1949. All patients with lesions of the neck were included except those who had superficial skin lesions, tumors of the thyroid, and conditions of the larynx, esophagus and great vessels.

The 609 cases included are summarized in table I. Of this group, 337 patients (55.3 per cent) came to the clinic with the chief complaint of a tumor or tumors in the neck. The correct diagnosis was suggested before operation in 413 instances (67.8 per cent). In 330 cases (54.2 per cent) the lymph nodes in the neck were involved. In 304 cases (49.9 per cent) the lesion was a malignant neoplasm; as indicated in table II, a tumor of the neck was the chief complaint of 167 (54.9 per cent) of these patients.

Malignant Neoplasms

Metastatic carcinoma. Carcinoma metastatic to cervical lymph nodes was found in 153 cases in which lymph nodes of the neck were subjected to histologic examination. Cervical metastatic lesions were grouped readily according to whether there was a diagnosed primary lesion above the clavicles (76 cases or 49.7 per cent),

Table II

Malignant Neoplasm

Tumor of Neck as Chief Complaint

Lesion	Number	Neck Tumor as Chief Complaint Number	Neck Tumor as Chief Complaint Pct.
Metastatic carcinoma			
Primary lesion above clavicles	76	31	40.8
Primary lesion below clavicles	52	10	19.2
Primary lesion not known	25	9	36.0
Lymphoblastoma	69	42	60.9
Primary malignant tumor			
Parotid adenocarcinoma	72	66	91.7
Submaxillary adenocarcinoma	7	6	85.7
Carotid body tumor	2	2	100.0
Fibrosarcoma	1	1	100.0
Total	304	167	54.9

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*Read at the meeting of the North Dakota State Medical Association, Grand Forks, North Dakota, May 29, 1950.

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an identified primary lesion below the clavicle (52 cases or 33.9 per cent), or a lesion whose primary site was not proved (25 cases or 16.3 per cent). In 20 of the 25 cases of cervical metastasis in which the source was not identified, the involved lymph nodes were in the lower cervical region. In the majority of these patients, poor general condition and a fixed abdominal mass or roentgen evidence of metastasis in the chest contraindicated further diagnostic procedures to determine the presence of a suspected primary lesion in the stomach or pancreas. In four of the five cases in which the primary lesion was unidentified and in which the involved upper cervical nodes were excised, the pathologist's diagnosis of squamous-cell epithelioma suggested that the source was intraoral or intranasal, although repeated examinations did not reveal such a lesion. In nine (36 per cent) of these 25 cases the chief complaint was the presence of a cervical tumor.

Table III

Metastatic Carcinoma: Primary Lesion Above Clavicles

Primary Lesion	Number	Pct.
Thyroid gland	19	25.0
Tongue	14	18.4
Larynx	8	10.6
Lip	6	7.9
Floor of mouth	5	6.6
Skin	5	6.6
Tonsil	4	5.3
Buccal mucosa	4	5.3
Parotid gland	3	3.9
Nasopharynx	2	2.6
Esophagus	2	2.6
External auditory canal	1	1.3
Soft palate	1	1.3
Nasal passage	1	1.3
Antrum	1	1.3
Total	76	100.0

The primary sites of the carcinomas in the 76 cases in which there were cervical metastatic lesions from tumors above the clavicles are given in table III. In 31 cases (40.8 per cent) of this group the presence of a tumor in the neck was the primary reason these patients sought medical attention. In 56 cases (73.7 per cent) dissection of cervical nodes was performed. The extensiveness of the procedure ranged from removal of the adjacent group of nodes to bilateral radical block dissection of the neck. Of the remaining cases in which conditions were not suitable for dissection of the nodes, in 11 a single node was excised for diagnosis, in seven biopsy of an involved node was performed, and in two aspiration of a fluctuant metastatic mass was done prior to insertion of radon seeds. In 61 (80.3 per cent) of this group of 76 patients, lymph nodes were enlarged and considered preoperatively to be the site of metastatic carcinoma. In four cases (5.3 per cent), enlarged cervical lymph nodes were considered inflammatory preoperatively. In 11 instances (14.5 percent) no cervical lymph nodes were palpable and dissection of the neck revealed the undiagnosed metastatic lesions. In most cases definitive treatment of the primary lesion had been performed, at varying times prior to the surgical procedure directed toward the cervical metastasis, although in some instances it was deferred until after dissection of the neck and ligation of a portion of the blood supply to that region.

Table IV

Metastatic Carcinoma: Primary Lesion Below Clavicles

Primary Lesion	Number	Pct.
Lung	21	40.4
Breast	14	26.9
Adrenal gland	3	5.8
Kidney	2	3.8
Prostate gland	2	3.8
Ovary	2	3.8
Rectum	2	3.8
Colon	2	3.8
Cervix	1	1.9
Uterus	1	1.9
Bladder	1	1.9
Skin	1	1.9
Total	52	100.0

In table IV are given the sites of the primary malignant neoplasms situated below the clavicles from which cervical metastasis occurred. In some cases previous surgical treatment of the primary lesion had been performed. It should be noted that metastatic lesions from the lung in 21 cases (40.4 per cent) and from the breast in 14 cases (26.9 per cent) comprised two thirds of this group. Usually metastasis occurred to a supraclavicular lymph node on the side of the pulmonary lesion, but spread only to the opposite side of the neck and bilateral metastasis were not uncommon. In the remaining 17 cases the primary site varied widely; in all but three cases in this group the metastatic tissue was present in a left supraclavicular node. In ten cases (19.2 per cent) the presence of a tumor in the neck was the primary complaint of the patient on admission. In 45 cases (86.5 per cent) the preoperative diagnosis of the palpable tumor was metastatic carcinoma.

Lymphoblastoma. The incidence of the various types of lymphoblastoma is evident in table V. The 33 cases of Hodgkin's disease represent 47.8 per cent of the 69 malignant lymphomas. The chief complaint of 42 patients (60.9 per cent) with this condition was cervical swelling. The clinical diagnosis of lymphoma was made in only 41 instances (59.4 per cent). In 36 cases (52.2 per cent) there were one or more unilateral enlarged cervical lymph nodes; in 33 cases (47.8 per cent) the lymphadenopathy was bilateral. No predilection for any par-

Table V

Lymphoblastoma

Pathologic Diagnosis	Number	Pct.
Hodgkin's type	33	47.8
Lymphocytic type	8	11.6
Giant follicular type	6	8.7
Reticulum-cell type	6	8.7
Lymphosarcoma (type not stated)	11	15.9
Inflammatory node (clinical diagnosis lymphoma)	3	4.3
Mikulicz's disease	1	1.5
Chronic lymphatic leukemia	1	1.5
Total	69	100.0

ticular group of nodes was noted in this series. In 12 cases (17.4 per cent) the lymphomatous tissue apparently was restricted to the neck and was unilateral in these cases; in the remainder of the cases such evidences of lymphoblastoma elsewhere as splenomegaly, mediastinal widening on roentgenograms of the chest, or widespread lymphadenopathy were noted. In three cases the lymph node excised was reported as inflammatory by the pathologist, but the patient was considered to have lymphoblastoma clinically. In one case biopsy of a tonsillar lesion and a cervical node thought to be the site of metastasis from it showed both to be lymphoblastoma.

Primary malignant tumors. The 72 cases of adenocarcinoma of the parotid salivary gland represent 87.8 per cent of the 82 primary malignant lesions of the neck in this series. Fifty-eight (80.5 per cent) of these parotid neoplasms were adenocarcinoma, grade 1 (mixed tumor type), of which 15 were recurrent growths. Six (8.3 per cent) were the cylindroma type of adenocarcinoma, of which two were recurrences. Eight (11.1 per cent) were adenocarcinoma not of the mixed or cylindroma types, and three of these neoplasms were recurrent. Of the 72 patients, 66 (91.7 per cent) presented the primary complaint of a tumor of the neck on admission to the clinic.

Adenocarcinoma of the submaxillary salivary gland was present in seven cases; in each instance it was of the mixed tumor type. In two cases the growth was recurrent. The presence of a tumor of the neck was the chief complaint in six of the seven cases.

Two cases of tumor of the carotid body and one case of fibrosarcoma of the neck were noted in this series. In each instance the cervical tumor caused the patient to seek medical attention. No case was encountered which was considered to be one of branchiogenic carcinoma.

BENIGN CONDITIONS

In the surgical treatment of swellings of the neck one encounters many different benign lesions. Of 305 patients in this series with benign conditions for which operation was performed on the neck, 172 (56.4 per cent) presented the chief complaint of a cervical tumor on admission.

Benign growths. The types of benign growths which were encountered most frequently are listed in table I. Among 162 patients in this group, the primary concern of 109 (67.3 per cent) was the presence of a tumor of the neck. In 110 cases (67.9 per cent) the correct diagnosis was made preoperatively. Vestigial remnants, such as cysts and sinuses of the thyroglossal duct (30 cases) and cysts and sinuses of the branchial cleft (13 cases), comprised the largest group of cases and usually were diagnosed before operation. Seven of the former and one of the latter were recurrent lesions. Lipomas occurred in 31 cases, with only 21 correct preoperative diagnoses, and were located in all regions of the neck. Even keratomas did not receive correct diagnoses before operation in five of the 35 cases. Of benign tumors occurring in the parotid region, adenocystoma lymphomatosum was encountered in six cases, and three of the five neurofibromas were situated in this region. None of the 17 parathyroid tumors treated surgically in 1949 were palpable. Of the 12 cases of parathyroid adenoma, in two the lesions were multiple. Four cases of primary parathyroid hyperplasia and one case of secondary hyperplasia were encountered.

TABLE VI

Miscellaneous Benign Tumors of the Neck

	Number
Parotid cyst	3
Dermoid cyst	3
Epidermoid cyst	2
Cystic hygroma	2
Lymphangioma	2
Hemangioma	2
Anomalous cartilage	2
Calcified ligament	1
Osteochondroma	1
Mandibular bone cyst	1
Fibroma	1
Desmoid	1
Hemolymph node	1
Parotid oncocytoma	1
Normal parotid	1
Normal muscle	1
Total	25

The 25 cases of miscellaneous benign growths of the neck, representing 16 entities seen less frequently in this series, are listed in table VI. Twenty of these 25 patients were primarily concerned over the presence of a cervical swelling. In only six of the 25 cases was the nature of the tumor correctly diagnosed before operation.

Lymph nodes. The results of a study of involved lymph nodes in 110 (76.9 per cent) of 143 cases of inflammatory conditions of the neck are tabulated in table VII. In 33 cases (30 per cent) tumor of the neck was the chief complaint.

Nonspecific inflammation. In 42 cases in which there was dissection of the cervical nodes because of the occurrence of a labial or intra-oral carcinoma, the pathologist reported the lymph nodes as inflammatory. The extensiveness of the surgical procedures ranged from a unilateral suprahyoid dissection to a unilateral radical block dissection with a suprahyoid dissection of nodes on the opposite side. In eight cases (19 per cent) enlarged cervical lymph nodes were present and considered clinically

TABLE VII

Inflammatory Lymph Nodes

	Number
Nonspecific inflammation	
Dissection of neck for carcinoma	42
Node excised when primary lesion treated	2
Node excised subsequent to treatment of malignant growth	10
Inflammatory though carcinoma of lung present	2
Node excised for diagnosis, no clinical cause evident	
Bacteriologic studies, negative	6
No bacteriologic studies	17
Tuberculosis	21
Boeck's sarcoid	8
Granuloma, indeterminate	2
Total	110

to represent metastatic carcinoma. In nine cases (21.4 per cent) cervical lymphadenopathy was considered to be inflammatory. In 25 cases (59.6 per cent) no cervical lymph nodes were palpable and a prophylactic dissection of the neck was performed. In no case was the presence of a tumor of the neck the patient's chief complaint.

In two cases a single lymph node removed at the time of treatment of a primary carcinoma was found to be inflammatory. In ten cases in which examination was done at the clinic subsequent to treatment of carcinoma, an enlarged lymph node excised for diagnosis was reported as inflammatory. In three of these ten patients the clinical diagnosis was metastatic carcinoma, and the chief complaint of these patients was tumor of the neck. In two cases of carcinoma of the lung the supraclavicular lymph node excised for diagnosis contained no metastatic tissue.

A pathologic report of "inflammatory" was given in 23 cases in which excision of a cervical lymph node was performed for diagnosis, after careful clinical investigation revealed no apparent cause for lymphadenopathy. Twelve of these patients were primarily concerned about their cervical tumor. In six cases the complete bacteriologic studies performed on a portion of the excised node gave essentially negative results. In seven of the remaining 17 cases, in which bacteriologic studies were not made, the record stated that the biopsy was performed primarily to exclude metastatic carcinoma; in the other ten cases, apparently the surgeon also was satisfied with a pathologic report of inflammatory lymph node.

Tuberculosis. Twenty-one patients with cervical tuberculous adenitis were seen in 1949. In 14 instances the patient presented the chief complaint of tumor of the neck; in only ten of the 21 patients was the diagnosis of tuberculosis made before operation. In 19 cases an involved lymph node was excised and in two cases an abscess was encountered which was incised and drained. Histopathologic examination was performed in the 19 cases; the diagnosis of a granulomatous lesion suggestive of tuberculosis was made in 16 cases (84.2 per cent). In 15 of these 16 cases complete bacteriologic studies on a portion of the lymph node were made, and positive results on culture or guinea pig inoculation for Mycobacterium tuberculosis were obtained in eight cases (53.3 per cent). Acid-fast organisms were present in smears of tissue in two of these cases. Of the three cases in which the pathologic report did not mention tuberculosis, in two the diagnosis was nonspecific inflammatory tissue and in one it was Boeck's sarcoid. The bacteriologic studies in these three cases gave a positive diagnosis of tuberculosis. In the two cases in which only pus was obtained, there was no pathologic study; on bacteriologic study Mycobacterium tuberculosis was found in one case but not in the other. Nevertheless, strong clinical evidence of tuberculous adenitis led to inclusion of the latter case in this group. In four cases there was evidence of active tuberculosis elsewhere in the body; in one the organisms were obtained on culture of the gastric contents, in two on culture of the sputum and in one they were found in an axillary node. Of the other 17 cases, in six a Ghon complex was evident on the roentgenogram of the chest, in one Pott's disease was present, and in ten there were no other stigmas of tuberculosis. In ten of the 21 cases, only a single cervical tumor was present. The ages of the patients ranged from six to 77 years, with cases occurring in every decade.

Boeck's sarcoid. In seven of eight cases, Boeck's sarcoid was diagnosed on pathologic study of the excised cervical lymph node. In the other case, though the pathologist reported an inflammatory lymph node, the clinical diagnosis was sarcoid. Complete bacteriologic studies were performed in six of the eight cases and in each instance the results were negative. Evidence of sarcoidosis was present on roentgenologic examination of the chest in seven cases. In no case did the patient complain of cervical tumor. The diagnosis was made preoperatively in four cases.

Granuloma indeterminate. All bacteriologic studies on the lymph nodes gave negative results in two cases reported as granuloma by the pathologist, and on clinical evaluation a definite diagnosis could not be made. In one interesting case, the pathologist reported that the granulomatous lesion resembled one caused by beryllium. Studies of a portion of the excised node by Dr. F. R. Dutra, Cincinnati, Ohio, failed to disclose beryllium, although the patient had had occupational exposure to the substance. The roentgenogram of the chest was considered more suggestive of sarcoid or tuberculosis than a lesion caused by beryllium.

Inflammatory lesions not associated with lymph nodes. In 33 cases operations were performed on the neck for various types of inflammatory lesions not definitely associated with lymph nodes. In 30 cases (90.9 per cent) the patient had the primary complaint of cervical tumor.

Inflammatory mass. In five cases the possibility of recurrence following treatment of a carcinoma led to excision of a cervical mass. In three of these cases foreign body reaction around suture material was found; in the other two cases only evidence of inflammation was noted. In six cases excision of inflammatory tissue was performed for diagnosis. Bacteriologic studies were not made in any of these cases. In one case, spicules of wood that had been present for four years were found to be the cause of the inflammation. In another case a talc granuloma that had occurred subsequent to thyroidectomy was discovered.

Abscess. Incision and drainage was performed upon ten cervical abscesses. In all cases the presence of a mass brought the patient to the clinic. One patient was operated on three weeks after a dental extraction; although no sulfur granules were found on direct examination of purulent material from the submaxillary abscess and only inflammatory granulation tissue was found on pathologic study of scrapings, Actinomyces israeli was obtained on culture. Tissue from the abscess wall in two cases was reported as characteristic of granulomatous inflammation. In one of these cases tuberculosis was suggested as a possibility in the pathologic report; in the other case blastomycosis had been diagnosed elsewhere. However, in both cases all bacteriologic studies gave negative results, and clinical findings did not confirm such diagnosis. Two parotid abscesses, one upper cervical abscess, and four submaxillary abscesses were incised and drained in addition to those in the three cases referred to in preceding sentences. A strain of streptococcus was cultured in two cases; all other bacteriologic studies gave essentially negative results. One abscess in the submaxillary region due to nonspecific organisms was incised and drained ten days after a dental extraction. In two cases origin of the abscess in a cyst was suggested.

Sialadenitis. Nine patients with submaxillary sialadenitis were treated surgically. In eight cases the chief complaint was tumor of the neck, and in seven cases the correct diagnosis was made before operation. Six of the nine cases were associated with or followed treatment of a calculus in Wharton's duct.

Three patients who complained of a cervical tumor were found at operation to have an inflammatory process in the parotid salivary gland. In each case a parotid neoplasm was considered preoperatively to be present.

Lesions not included in the survey. Tumors of the thyroid gland, the most common surgical lesion of the neck encountered at a large clinic, were not included in this survey but must be considered whenever the patient has a cervical tumor. A pharyngo-esophageal diverticulum may reach a size sufficiently large to present as a cervical swelling. Aneurysms of the subclavian and carotid arteries, prominence of the carotid bulb, and arteriovenous fistulas are tumors of the large vessels which occur in the neck. Other conditions causing a cervical tumor occasionally, but not seen in this study, are cervical rib, hernia of the lung, hydatid cyst, scurvy, enlarged thymus, ranula, hematoma of the sternocleidomastoid muscle, gumma, and supraclavicular pads of fat.

DIAGNOSIS

A survey, such as this, of cervical lesions which are encountered surgically makes one realize the wide variety of conditions to be considered when confronted by a patient with a cervical tumor. In addition, one must differentiate from these the many nonsurgical cervical tumors. In one's thinking the many possibilities should be clearly organized. The tables of this study list most types of cervical tumor. Watkins and Havens[1] have published a classification of conditions simulating or causing enlargement of cervical lymph nodes. More recently, Perzik[2] published his differential diagnosis of cervical lymphadenopathy. The classification of tumors of the neck presented by Lahey[3] separates the various conditions according to location and whether the tumor is discrete or multiple. As many authors emphasize, in order to handle the condition properly, a careful and systematic diagnostic study of each patient with a tumor of the neck should be made.

Incidence. A knowledge of the experience of others and the statistical probabilities of encountering various conditions in the neck is beneficial. As Martin and Morfit,[4] as well as others, pointed out, the commonest cause of chronic lymphadenopathy in adults is metastatic carcinoma. These authors made a study of cervical metastasis as the first symptom of carcinoma. In their group of cases they found that, given cervical metastasis and on the basis of chance alone, the most likely sites of a silent primary lesion are, in descending order of frequency, tonsil, nasopharynx, pharyngeal wall, extrinsic larynx, tongue, floor of mouth and palate. A cervical mass was, in their cases, the first symptom of a carcinoma that was primary in the nasopharynx in 50 per cent of the cases, in the tonsil in 33 per cent, at the base of tongue in 30 per cent, in the floor of the mouth in ten per cent, and in the gums in four per cent. These authors further found that a tumor of the neck with metastasis was the first symptom in 145 of 1,867 cases (7.8 per cent) of carcinoma of the mouth and pharynx, in seven of 89 cases (eight per cent) of carcinoma of the thyroid and in 11 of 1,744 cases (0.6 per cent) in which the site of the primary lesion was below the clavicles; in 55 cases in their series in which a primary lesion was not demonstrable, cervical metastasis was the first symptom.

Of the 1,290 cases of malignant neoplasm studied by Blady,[5] in 175 or 13.5 per cent cervical metastatic lesions were present on admission. Of these, 53 per cent of the metastatic growths were associated with tumors of the head and neck; the associated lesions in the remainder of the cases were lymphoblastoma in 30 per cent, tumors of the breast in six per cent, unknown primary tumor in four per cent, tumor of the lung in three per cent, tumor of the esophagus in two per cent and tumor of the skin in two per cent.

Martin[6] tabulated 500 cases of cervical metastasis from carcinoma of the head and neck as to the site of the primary lesions, with the following results: tongue 25 per cent, floor of the mouth nine per cent, extrinsic larynx nine per cent, nasopharynx eight per cent, lip seven per cent, tonsil seven per cent, mucosa of the cheek six per cent, unknown six per cent, jaws five per cent, pharynx five per cent, palate four per cent, skin of the face two per cent, thyroid two per cent, and miscellaneous five per cent.

Nowhere in the literature does one find information referable to the frequency of occurrence of benign enlargement of the lymph nodes. Undoubtedly, general practitioners and doctors in the specialties of ear, nose and throat, pediatrics, and dentistry will encounter many cases of acute inflammatory lymphadenopathy for each case of chronic cervical swelling. In table VIII are listed some of the causes of inflammatory lymphadenopathy. While these are considered nonsurgical conditions today, thanks to chemotherapy and antibiotics, at times even yet the lymph node may undergo suppuration and require incision and drainage.

Case history. A detailed and complete history should be taken. It is important to determine, if possible, the duration of the tumor. In this respect the patient's statement may be useless and misleading. The tumor may have gone unnoticed for a long time and then suddenly may have been noticed; the patient may be certain that it has just appeared. However, more and more patients

Table VIII

Nonsurgical Causes of Inflammatory Lymphadenopathy

- Oral and nasal infections
  - Tonsillitis
  - Pharyngitis
  - Vincent's angina
  - Ulcerative stomatitis
  - Sinusitis
  - Dental extraction
  - Periapical infection of tooth
  - Pyorrhea alveolaris
- Cutaneous infections of head and neck
  - Cellulitis
  - Erysipelas perstans facies
  - Impetigo contagiosa
  - Eczema
  - Seborrheic dermatitis
  - Pediculosis capitis
  - Tularemia
  - Anthrax
- Systemic diseases
  - Infectious mononucleosis
  - Measles
  - German measles
  - Scarlet fever
  - Smallpox
  - Diphtheria
  - Syphilis
  - Brucellosis
  - Histoplasmosis

are aware of the possible significance of a tumor, and they or their friends are more likely to spot an unusual swelling. If the duration is measured in years, the history is more significant in that the chances are remote that such a lesion is metastatic. Carcinoma of the salivary glands is slow growing in many cases. If a tumor actually has developed in a few hours or a day or two, an inflammatory process is responsible, but one should not rest on this feature alone.

Change in size and rate of growth is very significant. After a patient is once conscious of the presence of a tumor, his observations are more apt to be accurate. Slow, progressive, asymptomatic, asymmetric enlargement of a cervical tumor over a period of weeks or months favors metastatic involvement of a lymph node, though lymphoblastoma and tuberculous adenitis may have the same course. Rapid growth which then subsides suggests a nonspecific lymphadenitis. Growth in a previously stationary tumor suggests formation of more fluid or infection in a thyroglossal or branchial cleft cyst, carcinoma or hemorrhage in an adenomatous goiter, or progression of malignancy in a tumor of a salivary gland. Pain, if present, should be evaluated in relation to growth.

A history of previous drainage from the cervical tumor is significant, suggesting a cyst with suppuration or a tuberculous process. In line with this, a history of previous surgical treatment of the tumor and the findings noted at that time are helpful, though not diagnostic in themselves.

Not only should local symptoms be evaluated, but a complete review of systems also should be obtained. Particularly, one should note any deviations from normal in the intra-oral and intranasal regions, such as stuffiness or deafness in one ear, nasal obstruction, soreness in the mouth or throat, or a sore that will not heal, for these may give one a clue to the primary source of metastasis. Attention should be paid to all the other systems likewise, for almost any carcinoma can metastasize to the cervical region. Symptoms of a generalized systemic disease and their relation to the presence of the tumor should be elicited if present.

One piece of diagnostic information overlooked in some cases is that of previous treatment of carcinoma. This may have been a little "sore" burned off the lip, or mouth or face, or a mole removed by "light treatments." It may have been a hysterectomy, a gastric resection, or a radical mastectomy. But the possible significance should be borne in mind.

Physical examination. Many significant features of cervical tumors are evident on physical examination. At this point the differentiation between palpable and enlarged lymph nodes should be emphasized. Lymph nodes in the submaxillary and upper deep jugular regions of the neck may be one to two cm. in diameter and still be normal. Especially in slender or emaciated persons normal lymph nodes may be palpated. Therefore, care should be taken to distinguish the normal soft, flattened, bean-shaped lymph node from a pathologic one.

If the tumor is in an anatomic location for a lymph node, is enlarged, globular, soft and tender, an acute inflammatory process undoubtedly is causing the lymphadenopathy.

If the supposed lymph node is enlarging progressively, is firm to hard in consistency, rounded or irregular, and nontender, one must consider metastatic carcinoma. Malignant lymphoma may present the same findings but often such a tumor is soft, and may be multiple and bilateral. It must be remembered that malignant lesions may undergo degeneration and be soft in part.

Is the tumor fixed? Early metastatic carcinoma will be freely movable, and fixation of the node may indicate inoperability. Malignant lymphoma usually is not freely movable. The nodes in tuberculous adenitis tend to become matted.

The position of the tumor is most important. Carcinoma of the head and neck tends to follow a definite pattern of metastasis; early the usual site is one or two nodes in the group which first receives drainage from the lesion. This characteristic and the most frequent sites of nodal metastasis from the various lesions have been emphasized by Whitcomb[7] and Martin and Morfit.[4] Lymphadenopathy in the supraclavicular regions should suggest the possibility of metastasis from below the clavicles. Lymphadenopathy on an inflammatory basis from a focus of infection similarly will involve nodes that receive drainage from that region. In this regard, one of the most difficult problems can be to distinguish lymphadenopathy secondary to infection in an ulcerated intra-oral carcinoma from metastasis from the same lesion.

A few words about deep infections of the neck are in order. Most of these infections will be evident from the history and physical examination, but at times diagnosis of the exact nature of the swelling is perplexing. According to Beck,[8] 50 per cent of deep infections of the neck come from infection in the pharynx and tonsils. The cervical region most frequently involved from these sites is the pharyngomaxillary fossa. When dental in origin, the submaxillary, or Ludwig's angina type of deep cervical infection occurs. If after trauma to the hypopharynx, esophagus, larynx or trachea, the pretracheal fascia (visceral) type of deep infection of the neck occurs. If infection is from the mastoid tip, a condition known as "Bezold's abscess" results. Infection from the nose, nasal sinuses and nasopharynx may form a retropharyngeal abscess. If from the cervical vertebra, the infection is beneath the prevertebral fascia. Infection in the region of the carotid sheath is secondary to infection from other compartments or secondary to contact with infected cervical lymph nodes. The greatest dangers are erosion of blood vessels and spread of the infection downward along the fascial planes into the mediastinum. Ordinarily, along with the swelling there are the characteristic features of inflammation. Fluctuation is not always recognizable because of tenseness developed beneath the deep cervical fascia. Maxwell[9] has published an outline of the differential diagnosis of acute inflammatory swelling of the face and neck.

If swellings are discrete and in the midline, they are most likely to be caused by adenoma of the thyroid isthmus, hyperplasia of the pyramidal lobe, ectopic thyroid along the midline tract, cysts and sinuses of the thyroglossal duct, or dermoids.

If the swelling is in the parotid region, it is most commonly due to adenocarcinoma (mixed tumor type), but as brought out in our survey, other tumors may occur in this region. Epidemic parotitis (mumps) and parotitis following operation, debilitation and dehydration are nonsurgical lesions in this region.

When the lesion is cystic, cyst of the thyroglossal duct or of the branchial cleft, keratoma, epidermoid cyst, dermoid cyst and parotid cyst are the conditions to be differentiated. If suppuration has occurred in an inflammatory lymph node or in a metastatic tumor, the swelling may feel cystic. Acute deep infections of the neck and Pott's disease from a cervical vertebra may produce a fluctuant mass.

If the tumor is pulsatile, an aneurysm or arteriovenous fistula is probably present. If the tumor transmits a pulsation, is located at the level of the carotid bifurcation, and has motion laterally but not vertically, a tumor of the carotid body should be suspected. Vertical movement of the tumor with swallowing is pathognomonic of a thyroid tumor.

Examination of the head and neck must be thorough. The nose, nasopharynx, pharynx, mouth and cutaneous surfaces must receive careful scrutiny. It is not uncommon for a primary carcinoma to be so small that it is not evident for a long time after metastasis is noted. If evidence from the cervical tumor points to a primary lesion in this region, repeated careful examinations are indicated. This never should be construed as a reflection on the examiner, be he ear, nose and throat specialist or general practitioner. Any irregularity should be noted. When a lesion appears definitely inflammatory, rather than neoplastic, a trial of conservative treatment for a few days is indicated. If in this time healing has not occurred, further investigation is mandatory. Recent dental work, such as extractions, will be quite evident. One should not forget that the scalp may contain a small melano-epithelioma which is discovered only on careful search.

Needless to say, careful examination of the entire body should be performed. The presence of findings such as an abdominal or pelvic tumor, a rectal mass, a hard irregular prostate, a testicular tumor, or an enlarged and nodular liver are probable evidence of a distant carcinoma when the cervical tumor is considered metastatic. An enlarged spleen is evidence favoring leukemia, lymphoblastoma or infectious mononucleosis. The presence of a rash, especially in children, may be the tip-off to one of the acute exanthemata. An elevation of the patient's temperature and pulse are usually indicative of an acute inflammatory process, but may occur with Hodgkin's disease. Furthermore, knowledge of the general condition of the patient is important in evaluating the surgical risk in the case.

Special studies. Roentgenologic studies often are helpful in evaluation of a cervical tumor and may suggest the diagnosis preoperatively. A roentgenogram of the chest of every patient with a cervical swelling should be taken routinely. The presence of a primary pulmonary tumor, metastatic pulmonary lesions, evidence of Boeck's sarcoid or of lesions of tuberculosis in the chest, or enlargement of mediastinal or hilar nodes in lymphoblastoma should suggest the possible etiologic cause of the associated cervical lymphadenopathy. Roentgenograms of the sinuses may show evidence of sinusitis or the presence of a tumor. Dental roentgenograms may disclose periapical dental infection as the cause of inflammatory lymphadenopathy. In cases of inflammatory swelling of a submaxillary or parotid salivary gland, roentgenograms should be taken to discern a calculus in Wharton's or Stensen's duct. In an occasional case in which a draining sinus is associated with a cervical lesion, it will be helpful to inject iodized oil into the sinus and take roentgenograms to determine the ramifications of the tract before undertaking surgical treatment. As indicated from the history and physical findings, roentgenologic examination of the stomach, colon or kidneys may be in order.

Laboratory procedures may be useful. In order to exclude leukemia as a cause of the cervical swelling, a total leukocyte count and differential study of the leukocytes in a smear should be performed. These tests may be helpful, also, in suggesting the presence of an acute infection. If infectious mononucleosis is a possibility, a heterophile antibody reaction should be performed. Syphilis is rarely a cause of cervical tumor, but a serologic test for syphilis should be made, especially if multiple small, soft lymph nodes are present. The tuberculin test alone does not give diagnostic results; usually, however, when it gives negative results with the second strength, tuberculosis is unlikely and Boeck's sarcoid may be suggested. Parathyroid tumors are diagnosed entirely on the basis of laboratory studies.

Special endoscopic studies should be made as indicated in search of a primary lesion in the nasopharynx, larynx, lung, esophagus or rectum.

Biopsy of primary lesions. If an area of chronic ulceration, induration, tumefaction, or irregularity is found on examination of the head and neck, biopsy of this lesion should be performed before consideration of further procedures directed toward the cervical tumor. To re-emphasize, the exact diagnosis of any possible primary lesion should be ascertained before considering treatment of the cervical tumor. Treatment of both the primary carcinoma and any metastatic lesions will vary with the type and grade of the carcinoma, as well as with the other factors to be considered.

Biopsy of cervical tumor. An accurate pathologic diagnosis of a persistent tumor of the neck should be made in most cases after all other diagnostic studies have been employed. If the condition of what was considered to be an inflammatory lymph node does not begin to improve on conservative treatment within a few days or if there is progression in size, biopsy is indicated. If the findings are suggestive of lymphoblastoma or metastatic carcinoma in which roentgen therapy is indicated, a pathologic diagnosis should be made before treatment is instituted in order to evaluate the response accurately. Biopsy may be indicated to help determine operability of a carcinoma situated below the clavicles. Even though a primary lesion of the head or neck is not evident, if one cannot exclude metastatic carcinoma, then biopsy of the tumor of the neck should be performed. If a specific inflammatory lesion, such as tuberculosis or Boeck's sarcoid, is suspected, operation is indicated for diagnosis.

Aspiration biopsy of the cervical tumor for diagnosis is advocated by Martin and Morfit,[4] Blady,[5] Carver[10] and Perzik.[2] Whitcomb[7] and others have advocated use of the Silverman needle in biopsy of the enlarged node suspected of being the site of malignant disease.

It has been the feeling at the institution with which we are connected that when biopsy is indicated, excisional biopsy of the enlarged node is preferable. In only one case in this survey was other than excisional biopsy performed; pathologic study of fresh frozen sections of tissue obtained with a Silverman needle from a left supraclavicular node confirmed the clinical impression of metastasis from carcinoma of the rectum. Accurate pathologic diagnosis is sometimes difficult when a lymph node is examined, especially if the amount of tissue is small. A negative result with aspiration or punch biopsy has no significance. Because the majority of patients at the clinic come from some distance away, it is desirable to obtain an accurate and early diagnosis, and to institute appropriate treatment at once. This can be accomplished more readily by excisional biopsy of the involved node in most cases. However, it is suggested that for patients suspected of having metastasis from below the clavicles, biopsy with a Silverman needle could be performed, with everything in readiness for excisional biopsy if the former is not diagnostic. In these cases the morbidity would be lowered, for further surgical treatment would not be indicated.

The surgeon and the patient should be prepared at the time of biopsy to proceed with dissection of the neck, thyroidectomy or other surgical procedures as indicated. In this connection, the study of fresh frozen sections by a capable pathologist is essential.

If biopsy has been performed and the surgeon decides to refer the patient for further surgical or roentgenologic treatment elsewhere, the pathologist's report, the slides, and frequently also the tissue, should be sent at the same time. This is a valuable aid in evaulation of the condition under such circumstances, though biopsy diagnosis at the institution where definitive treatment is to be performed is usually preferable.

In cases in which multiple lymph nodes are enlarged and found in different regions of the body, careful selection of the node for biopsy should be made. As elucidated by Heinrich and Judd[11] in their analysis of biopsy of lymph nodes, a positive result of the biopsy is most likely to occur when a cervical lymph node is used. Nodes from the axillary region are less favorable for diagnosis, and those from the inguinal region are much less desirable. Other factors of significance in the selection of a node for biopsy are the size and accessibility of the node, and the desirability of obtaining a node with longstanding rather than recent enlargment.

If a lymph node or other tissue is encountered in which excision is not feasible because of size or fixation, it should be emphasized that, in all fairness to the pathologist, for an accurate diagnosis the biopsy specimen obtained should be adequate in size and taken from a viable rather than necrotic area. If multiple small nodes are present it may be wise to remove three or four through the same incision.

Bacteriologic studies. In all cases in which an inflammatory basis for the lymphadenopathy is suggested by the preoperative diagnostic studies, or in which the gross appearance of the excised tissue is inflammatory, the surgeon should cut the lymph node in two. Half should be sent to the pathologist and half should be placed in a sterile closed jar. If the diagnosis after study of fresh frozen sections is definitely that of neoplasm, the other half of the tissue can be discarded or given to the pathologist. If the initial pathologic diagnosis is equivocal or the condition is found to be inflammatory, the sterile remaining tissue should be sent to a laboratory for special bacteriologic study. If the pathologist reports that the lesion is inflammatory and tissue has not been saved, a portion of the fresh tissue sent to the pathologist or preferably another biopsy specimen should be sent for bacteriologic study. Inflammatory tissue other than lymph nodes should be handled similarly. If an abscess is encountered, tissue from the wall of the abscess, in addition to the pus, should be obtained for studies. Less contamination and better bacteriologic studies may be possible if the abscess is aspirated through a 16 or 18 gauge needle, using a large (20 to 30 cc.) syringe to obtain good suction if the pus is unusually thick.

We are fortunate in having a laboratory for performance of bacteriologic studies of tissue, which are carried out by Dr. L. A. Weed. Details of the laboratory technics will not be included in this paper, but mention should be made of the various studies employed. A smear of the specimen is examined for acid-fast organisms. If pus is present, or if there be other indications, it is examined directly for the presence of sulfur granules. In special cases sections of tissue are made and stained for organisms. Material from the specimen is routinely cultured for pyogenic bacteria, Brucella, fungi, and acid-fast organisms. Guinea pigs are routinely inoculated to determine possible presence of Mycobacterium tuberculosis. If actinomycosis or other unusual disease is suspected, special cultures are made for such organisms. If Mycobacterium tuberculosis is isolated, subsequent laboratory studies of its sensitivity to streptomycin are performed.

The results of bacteriologic studies made in the 56 cases in which tissue from the cervical region was obtained at operation during 1949 are outlined in table IX.

TABLE IX

Cervical Tissue With Bacteriologic Studies: Final Diagnosis

	Number
Lymph node excised	
Tuberculosis (positive bacteriologic studies—11)	18
Boeck's sarcoid	6
Granuloma, indeterminate	2
Nonspecific inflammation	6
Lymphoblastoma	11
Metastatic carcinoma	2
Abscess incised	
Tuberculosis (positive bacteriologic studies—1)	2
Actinomycosis (Actinomyces israeli cultured)	1
Granuloma, indeterminate	2
Nonspecific	3
Recurrent branchial cleft cyst	1
Mandibular bone cyst	1
Submaxillary salivary gland	1
Total cases	56

Bacteriologic studies made possible a positive diagnosis of Mycobacterium tuberculosis in 12 cases and Actinomyces israeli in one case. Results in the remainder of the cases were essentially negative. Evaluation of the results in cases of tuberculous adenitis was given in a previous section.

COMMENT AND CONCLUSIONS

The presence of a cervical tumor is the primary concern of many patients. A careful and systematic diagnostic study should be employed in all cases of cervical swelling. The seriousness of the presence of a tumor of the neck is emphasized by the fact that in our group of surgical cases, 50 per cent of the lesions were malignant.

Benign tumors are excised to eradicate a site of actual or potential infection, for cosmetic reasons at the patient's request, or because of inability to differentiate them from a malignant lesion.

Adenocarcinoma of the parotid salivary gland, which comprises most of the primary malignant tumors of the neck, is so situated that it is relatively amenable to diagnosis.

A clinical diagnosis of lymphoblastoma should be confirmed by biopsy. An accurate pathologic diagnosis should be made before treatment with roentgen therapy, cortisone, ACTH (adrenocorticotropic hormone) or other drugs, in order to evaluate the response properly.

From the aspects of prognosis and treatment, the most important problem in the majority of cases is whether the swelling is a lymph node, and if so, what is the nature of the lymphadenopathy. Fortunately, from a diagnostic standpoint, in most cases of acute inflammatory lymphadenopathy there are a sudden onset, local or systemic manifestations of the causative conditions, and subsidence of the condition on conservative treatment.

Specific inflammatory lesions of cervical lymph nodes, such as tuberculosis and Boeck's sarcoid, should undergo pathologic and bacteriologic studies in order that they may be properly treated.

As emphasized by others and borne out in our study, metastatic carcinoma is the commonest cause of chronic cervical lymphadenopathy of adults. Especially is this true when there is unilateral enlargement of cervical nodes. Because of the difficulty in making a clinical diagnosis, biopsy should be performed in all cases of persistent cervical lymphadenopathy, after careful search for a primary lesion.

With the acceptance of the theory of embolic spread through the lymphatics, carcinoma that is metastatic to cervical nodes from a primary lesion in the head or neck often is amenable to treatment. It is not within the scope of this survey to present the controversial views on handling these lesions. A recent publication by Judd and Beahrs[12] presents the opinion of the clinic in the management of epithelioma of the lip, and similar management of intra-oral lesions is indicated. Paramount in directing treatment is the inability to determine clinically whether metastasis is present, with or without enlarged nodes as brought out in this survey.

Metastasis to Virchow's node can result from the presence of almost any carcinoma, and this is well illustrated in our survey. From the standpoint of operability and prognosis, it is important to diagnose cervical metastatic tumors that have come from a primary lesion below the clavicles.

If biopsy is indicated for diagnosis, the diagnostic studies should be complete. Except in cases of dissection of the lymph nodes in the presence of a primary carcinoma elsewhere, when the pathologist does not give an unequivocal report of neoplasm a full bacteriologic study of a portion of the tissue, according to the plan given, should be initiated.

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(Continued on page 450)

The Present Status of Surgery in the Treatment of Hyperthyroidism*

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Surgeons would be the first to concede that if hyperthyroidism could be treated completely and safely by a preparation administered orally, that method should prevail. However, to date, there has been no agent which has been demonstrated conclusively to satisfy such a criterion. For many years, subtotal thyroidectomy was the definitive treatment used in the majority of cases of hyperthyroidism, although the inevitable small proportion of cases in which either recurrence or myxedema develops cannot be overlooked. Anyone interested in this type of surgery is familiar with the developments which followed the introduction of the clinical use of iodides. More recently, the multiple-stage operations have become obsolete, although it has not been so very long since they were routine. The ultimate one-stage operation then enjoyed a rather uniform acceptance.

When the goitrogens were introduced to the field of clinical medicine, there was a certain wave of enthusiasm toward not only improving upon the surgical results but actually replacing surgical therapy by a more conservative plan. It was not long, however, before most observers discovered that certain of these agents were associated with distressing complications and, during the interval, clinical reviews have tended to point out that there is still a very large place for the surgical treatment of hyperthyroidism.

Because of the distinct differences in the two main types of hyperthyroid states, each should be considered separately.

Exophthalmic Goiter

Black in 1946[1] evaluated the status of thyroidectomy as compared to the use of goitrogens. He surveyed the records of the Mayo Clinic in the years 1936 through 1945. With the notable exception of the year 1938, when the surgical mortality rate for exophthalmic goiter was 1.8 per cent, the rate was one per cent or lower in every year. In fact, for the final four years of Black's study, the mortality rate was 0.6 per cent or less (Table I). With complete justification, Black felt that subtotal thyroidectomy could be carried out for more than 97 per cent of patients after they had been properly prepared with Lugol's solution, and he favored one-stage subtotal thyroidectomy. He was conservative in concluding that recurrence would develop in less than five per cent of the patients so treated. His favor of subtotal thyroidectomy in exophthalmic goiter was backed by the finding that the risk was only very little greater than that attending the operation upon patients who had nontoxic adenomatous goiters. In the final year of his report (1945), the surgical mortality rate in 302 consecutive cases of exophthalmic goiter was 0.3 per cent (Table I.)

Table I.

Comparison of Hospital Mortality Rates: Surgical Treatment of Adenomatous Goiter without Hyperthyroidism and Exophthalmic Goiter, 1943-1949*

Year	Exophthalmic Goiter			Adenomatous Goiter without Hyperthyroidism		
	Total Patients	Hospital Deaths		Total Patients	Hospital Deaths	
		Number	Pct.		Number	Pct.
1943	363	2	0.6	286	1	0.3
1944	341	2	0.6	364	0	
1945	302	1	0.3	362	1	0.3
1946	260	0		375	0	
1947	195	0		362	1	0.3
1948	156	0		297	0	
1949	161	0		419	0	

*Years 1943-1945 embrace the study of Black.[1] Years 1946-1949 concern the present study.

Black[1] analyzed data concerning the two to three per cent of the total group of patients who underwent the operation and who represented a somewhat elevated surgical risk because of their severe hyperthyroidism. These were the patients who, in earlier years, would have undergone stage operations. In addition, the patient who has recurrent exophthalmic goiter is likely to be in less satisfactory condition for surgical operation, and the technical features in such an instance would be much more prominent. A unique group which Black commented on briefly comprised those patients treated surgically for exophthalmic goiter who were known to be suffering from other diseases, such as metastatic carcinoma or leukemia. Obviously, such patients would have to constitute an entirely separate group.

Using the criteria available in 1946, Black[1] felt that there was little room for the improvement of treatment in the great majority of cases of exophthalmic goiter. On the other hand, in the two to three per cent of patients who represented a markedly elevated surgical risk primarily because of their hyperthyroidism, he felt that the goitrogenic drugs might have a definite place in the preoperative preparation. Looking to the future, he expressed the hope that those suffering from recurrent exophthalmic goiter, especially when surgical treatment of them would be associated with great technical danger and, in addition, those suffering concurrently from an incurable disease, might derive considerable benefit from the use of goitrogens without operation.

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*Read at the meeting of the American Goiter Association, Houston, Texas, March 9, 1950.

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Goldman[2] in 1948 reported on a series of 379 patients operated on for exophthalmic goiter. He presented some rather complete statistical information: the hospital mortality rate was one per cent and the incidence of myxedema was 9.2 per cent. Tetany was reported in 1.5 per cent of cases, and thyroid crisis in another 1.5 per cent.

In evaluating the results that could be expected from the operation, Pemberton, Haines and Keating[3] analyzed the records of 455 consecutive patients with exophthalmic goiters treated by subtotal thyroidectomy, without a single death. During that same period, 334 patients who had toxic adenomatous goiters underwent surgical therapy, with only two deaths.

To analyze the current trend in the treatment of hyperthyroidism, the records of the Mayo Clinic for the years 1946 through 1949 were reviewed. This four-year period follows immediately upon the period concerned in Black's study. Hence, it is of interest to compare contemporary results with those he reported in 1946. For purposes of comparison, the statistics available from the final three years of Black's report were used and appear in Table I. Here again, we have employed these statistics in surgical results for adenomatous goiter without hyperthyroidism, using this as a base line.

In Table I is presented a comparison between the present-day results, interpreted in terms of the hospital mortality rates associated with exophthalmic goiter and adenomatous goiter without hyperthyroidism. It is gratifying to report that in the four-year period just completed (1949) there were no hospital deaths among the persons with exophthalmic goiter. It must be pointed out, however, that the total number of such patients has decreased in recent years, a common experience in all clinics where this type of condition is seen.

RADIOACTIVE IODINE

After the introduction and rather wide use of the goitrogens came the development of radioactive iodine. This, of necessity, was kept limited to certain centers in which the element was available. Certain enthusiastic workers predicted that surgical treatment soon would have little or no place in the treatment of goiter, especially in exophthalmic goiter. The prediction has not been completely true in any of the centers. However, an impressive summary was presented by Crile and others[4] in 1949, when they reported on a series of 105 patients who had been treated with radioactive iodine. They pointed out that it was a simple, effective and, thus far, apparently safe method. They found that in 90 per cent of cases of exophthalmic goiter, control was realized within two to four months by one or two treatments. In the remaining cases a third treatment was required. Crile and associates[4] observed that thyroid enlargement receded and that the symptoms were as satisfactorily overcome by that method as they were by surgical intervention. They observed a certain small incidence of hypothyroidism which was felt to be temporary. These authorities, however, agreed with others that use of the element among younger patients is of uncertain advisability and for that reason they have avoided it.

Opinion at the Mayo Clinic in regard to radioactive iodine has been expressed by Black[1] and by Pemberton, Haines and Keating.[5] Excellent results have been observed to follow use of the element in certain instances of exophthalmic goiter. At the same time, the exact effect of radioactive iodine on other endocrine glands has not been determined as yet. The obvious question that is always raised in regard to any carcinogenic property the element might have cannot be answered at present, and probably not in the near future. To date, no case has been reported in which carcinogenesis is known to have been caused and it may be that this is an unwarranted fear. On the other hand, the disastrous consequences of uncontrolled roentgen-ray and radium treatment of the early days, resulting in numerous malignant lesions of the skin, are well known to everyone. Time alone will provide the answer to the question of the carcinogenic properties of radioactive iodine.

In the small series of patients treated with radioactive iodine it has been found that there have been some failures and, in addition, a few definite recurrences. Use of the element at present is reserved for those patients of older age groups for whom thyroidectomy is regarded as unduly hazardous. This group includes the very elderly, especially those with a poor cardiac reserve. It may well include the patient who previously has undergone thyroidectomy several times and presents himself with a recurrent goiter, tetany and possibly a fixed vocal cord. In those cases in which recurrence has taken place, even though very little palpable gland remains, it has been felt that surgical treatment might have no more to offer than a more conservative plan.

GOITROGENS

Recently, refinements in goitrogens have led certain authorities to further study. Thus, Bartels and Ingham[6] have reported on the use of methylthiouracil in 100 patients. They found this to be a somewhat more potent agent than the other goitrogens but, at the same time, somewhat more toxic. They commented on the fact that the reactions of toxicity may have been related to previous antithyroid therapy which had been administered before the use of methylthiouracil. Pemberton, Haines and Keating[3] have listed the disadvantages of any goitrogen therapy in three main categories: (1) reactions of toxicity (which may be less of a problem now than they were at first), (2) frequent recurrence of hyperthyroidism after cessation of use of goitrogens, and (3) probably most important, the extreme difficulty of accurate periodic, prolonged observation which is essential to the securing of proper results in this form of therapy.

A complete review of the goitrogens is not appropriate here. Suffice it to say that the widespread use and abuse of them has produced common knowledge of their powers and limitations. With a rate of failure of nearly 50 per cent and the natural tendency of the patient to tire of the prolonged observation, the goitrogens *alone* appear to have very limited usefulness.

Adenomatous Goiter with Hyperthyroidism

The treatment of adenomatous goiter has always been surgical. Now, more than ever before, the conviction is firm that a nodular goiter, whether it is a single or multiple lesion, should be removed, not only because carcinoma may already be present within the thyroid gland, exhibiting none of the characteristic signs, but also because removal would serve as "prophylaxis" against the development of a malignant process in the future.

Cole and his co-workers[7] recently reported that their latest survey has borne out the suspicion they had in earlier years that the incidence of malignancy in adenomatous goiters is much higher than the profession had appreciated. They reported the over-all incidence of carcinoma in nodular goiter to be eight per cent. They found a great difference between patients with hyperthyroidism and patients without it, since only one per cent of carcinomas occurred in patients with toxic goiter, whereas 17.5 per cent of carcinomas occurred in patients with nontoxic goiter. Their latest study also bore out their original impression in regard to solitary nodules in the thyroid gland, in which nodules they discovered an incidence of malignancy of 24 per cent. Lange and MacLean[8] presented a collective review in which they found an over-all incidence of malignancy in nodular goiter of 6.94 per cent. They, too, discovered that the incidence of malignancy was definitely higher in the single adenoma than in multiple nodules. They differed from Cole and co-workers[7] in reporting that the existence of hyperthyroidism does not in any way minimize the ever-present possibility of carcinoma, since 26 per cent of their patients with carcinoma had frank hyperthyroidism. They stressed the fact that the goitrogens in such a case should be used only for preoperative preparation. They also raised once again the question as to whether the goitrogens might not in themselves have carcinogenic properties.

Fortunately, the results of subtotal thyroidectomy in toxic nodular goiter are most gratifying in that true recurrence is very uncommon. It is to be admitted, however, that the surgical mortality rate in this group of patients is definitely higher than that for persons with exophthalmic goiter. We have held for some time that this is due to the fact that patients with adenomatous goiter usually are in the higher age groups and that, therefore, in addition to being in less satisfactory general condition, they have other diseases common to their advanced age. Then, too, adenomatous goiter may have been present for many years, and the onset of the hyperthyroidism may have been so insidious that considerable pathologic change actually has occurred before the patient presents himself for treatment. Serious cardiac damage of irreversible nature often is found in this group. Any statistical report on adenomatous goiter must necessarily include those patients who have been submitted to thyroidectomy for control of the adenomatous goiter with hyperthyroidism prior to treatment for some other co-existing serious disease. Anyone seriously interested in this problem frequently will encounter the patient who has congestive heart failure or coronary artery disease and in whom the exact extent of the hyperthyroidism cannot be determined prior to surgical treatment. It appears that in such a situation there is a great opportunity for some more conservative measure to prove itself. In the seriously ill patient who has an adenomatous goiter with hyperthyroidism, it has been disappointing to all physicians to note how limited is the effect of Lugol's solution. It was hoped for a time that the goitrogens would be far more effective in this particular condition, especially in preoperative preparation. To date, however, the latter agents have not appeared to be as effective in this condition as they are in exophthalmic goiter.

The experience at the Mayo Clinic has been rather similar to that of Goldman[2], who reported on 179 patients who underwent thyroidectomy for adenomatous goiter with hyperthyroidism, among whom there were definite recurrences in 0.5 per cent. Good results were recorded as occurring in 95 per cent of the patients. The hospital mortality rate was 0.5 per cent. The experience of Fahrni[9] has been similar; he has concluded that the present situation calls for thyroidectomy in adenomatous goiter, whether toxic or not, since thus far there is no other means known to treat the patient satisfactorily.

The surgical mortality rates for adenomatous goiter treated surgically at the Mayo Clinic from 1946 through 1949 have been compared with similar rates in the immediately preceding three years which ended the study presented by Black.[1] This information is offered in Table II.

Table II

Comparison of Hospital Mortality Rates: Adenomatous Goiter With and Without Hyperthyroidism, 1943-1949*

	Adenomatous Goiter with Hyperthyroidism			Adenomatous Goiter without Hyperthyroidism		
Year	Total Patients	Hospital Deaths		Total Patients	Hospital Deaths	
		Number	Pct.		Number	Pct.
1943	262	5	1.9	286	1	0.3
1944	237	1	0.4	364	0	
1945	214	2	0.9	362	1	0.3
1946	218	2	0.9	375	0	
1947	116	0		362	1	0.3
1948	162	0		297	0	
1949	109	0		419	0	

*Years 1943-1945 embrace the study of Black.[1] Years 1946-1949 concern the present study.

Reference to Table II reveals that progress also has been made in recent years in the treatment of adenomatous goiter, since in the three-year period just completed there were no hospital deaths of patients with adenomatous goiter with hyperthyroidism. That this has not always been the case is borne out by the same table, which reveals a difference in earlier years.

TABLE III

Hospital Mortality Rates: Toxic Goiter and Adenomatous Goiter, 1946-1949

	Number	Pct.
Toxic Goiter		
Total patients	1,377	
Total hospital mortality	2	0.14
Adenomatous goiter without hyperthyroidism		
Total patients	1,453	
Total hospital mortality	1	0.06
Causes of death* in toxic adenomatous goiter		
Cardiac failure	1	
Postoperative crisis	1	

*Both occurred in 1946.

HOSPITAL MORTALITY RATES

In Table III is presented a summary of the trend in surgical treatment in the four-year period just completed (1949). This follows upon the study in the earlier years completed by Black.[1] It will be noted that each of the two patients who died in the hospital with toxic goiter had adenomatous goiter. Undoubtedly, this favorable situation represents an even more complete preparation of the patient afforded by the goitrogens used in conjunction with Lugol's solution. However, it may be stated emphatically here that the untiring vigil maintained by the internists should receive full credit for pointing the way in the proper selection of patients who might do well under surgical management, as well as for stressing the importance of avoiding surgical treatment for those patients who are not at all reasonable surgical risks. The cause of death in the two instances at hand is self-evident. The one patient who died of a postoperative crisis constituted somewhat of a surprise, since she had been treated thoroughly with Lugol's solution preoperatively and was judged to be in rather good condition at the time of operation. The prolonged interval necessary for preparation with goitrogens was not utilized in her case, since it was not felt necessary or justifiable. Whether in a similar case use of a goitrogen might have been more effective cannot be determined from a review of the records.

SUMMARY AND CONCLUSIONS

The surgical hospital mortality rate associated with exophthalmic goiter has declined steadily to the point where, for the past four consecutive years, there have been no deaths.

Proper preparation of the patient with Lugol's solution, and the judicious addition of the goitrogens in a few instances, have brought about this highly satisfactory result. This present-day situation is directly due to the ability of the internist now to select those very few patients who would not tolerate subtotal thyroidectomy.

Radioactive iodine is an extremely simple and, in many cases, highly effective treatment for exophthalmic goiter. It may some day be proved to be the treatment of choice. At present, the unknown properties of radioactive iodine make it inadvisable to use it as a treatment for any but elderly patients or those who are very poor surgical candidates.

In adenomatous goiter with hyperthyroidism, the ever-present threat of malignancy dictates that surgical treatment shall prevail. The steadily declining hospital mortality rate associated with surgical intervention for this condition is apparent, there having been no deaths after operation for the disease in the last three years at the Mayo Clinic, and only two in 1946.

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SALT WATER FOR SHOCK

A group of leading American surgeons has advised the Public Health Service, Federal Security Agency, that salt water taken by mouth, in a vast majority of cases, is as effective as blood plasma in the emergency treatment of shock from serious burns and other injuries. In general terms, the treatment calls for approximately one level teaspoonful of table salt and one-half teaspoonful of baking soda for each quart of water. A number of quarts are required each day. The only limitations on the amount consumed is the ability of the patient to consume the saline solution.

In releasing the recommendation, which came to the Public Health service as the major federal agency charged with responsibility for civilian health, surgeon general Leonard A. Scheele said: "The findings are of particular importance in a period of war emergency, since it is estimated that in the event of atomic bombing about 60 per cent of the surviving bombed population might suffer from burns. This figure, moreover, does not account for injuries other than burns in which shock also might be present."

Suppurative Diseases of the Lungs— Advances in Surgical Management

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Surgical management of suppurative disease of the lung has progressed to the point where at present a degree of standardization has been reached with further advancement lying chiefly in the field of improvement in technical procedures.

Prevention of pulmonary suppurative disease is preferable to radical surgery as a cure. It has been shown that with complete atelectasis in the absence of associated infection suppuration does not occur. If, however, partial obstruction is produced in the presence of infection, pneumonitis then results leading to extensive bronchiectasis in four weeks.[1] These changes are reversible if the obstruction is relieved within seven to ten days. Applied clinically, all postoperative patients should be watched for evidence of obstructive pneumonitis with prompt correction of the same. Foreign bodies in the bronchi must be removed at once. Children with measles and whooping cough should be closely observed as they are candidates for pneumonitis which can develop into bronchiectasis. In lung abscesses it has been shown that the infective organism is found in abundance around the teeth, thus pointing to the necessity of adequate dental hygiene.[2]

Bronchiectasis

One of the outstanding accomplishments in thoracic surgery has been the excellent results obtained in the treatment of unilateral bronchiectasis. Once diagnosis has been established by a bronchogram and bronchoscopy has ruled out pathologic bronchial obstruction and as soon as bronchial secretions are reduced with antibiotics, the treatment is lobectomy. The use of tourniquet amputation of the hilum of the affected lobe has fallen into discard. The present accepted technic is individual ligation of the vascular elements of the hilum of the lobe followed by closure of the bronchus by end on silk sutures. Care is taken not to traumatize the bronchus by use of clamps. The bronchial stump is covered with a pleural flap, and rapid reexpansion of the remaining lobe of the lung is carried out through constant intrapleural suction. The use of antibiotics and refinements of technic has virtually eliminated postoperative complications of bronchial fistula and empyema. Present mortality rates are less than two per cent for lobectomy in unilateral bronchiectasis.

In the past four years the use of segmental resection has come into greater use in an attempt to conserve pulmonary tissue. This refinement is based upon the concept that there are within each lobe of the lung definite anatomical segments with their own bronchus, arteries, and veins, and that these segments may be anatomically removed without damage to adjacent lung tissue. According to the classification of Jackson and Huber[3] there are ten such segments in the right lung and eight in the left. Boyden[4] at the University of Minnesota has made a monumental contribution to segmental anatomy of the lung. When consideration is given to the fact that the majority of pulmonary diseases have sites of predilection then the reason for application of segmental resection becomes apparent. For instance, bronchiectasis usually involves the basilar segments of the lower lobes. The linguala of the left upper lobe and bronchi of the right middle lobe are often involved. The superior divisions of the lower lobes and anterior divisions of the upper lobes are common areas for lung abscess. Pulmonary cysts are frequently found in the superior division of the lower lobe.[5]

Accurate delineation of lung segments is secured by bronchographic studies. Radiologic localization has been found to be more accurate than the surgeon's impression at the time of thoracotomy. The technic widely used is that of positively identifying the segment, ligating the segmental arterial supply, severing the bronchus and with the remaining portion of the lobe inflated, the segment is removed in a retrograde manner by finger dissection using the intersegmental vein as a guide.[6] This procedure while fine theoretically, does from the practical side carry a higher incidence of increased empyema, bronchial fistula, and unexpanded lung segments. Its greatest application is in bilateral bronchiectasis where maximum lung tissue must be conserved.

Bilateral bronchiectasis poses a more difficult problem. The majority of these patients have neglected their disease or have been mismanaged. Not only are many of these patients in poor general condition but it is difficult to get adequate preoperative reduction in sputum volume using antibiotics in aerosol and parenteral form. When such a patient has obtained the maximum benefit of preoperative preparation a resection of the involved lung segments is done on the side showing the greatest extent of bronchiectasis. Following this there may be sufficient clinical and symptomatic improvement in cases having minimal involvement of the contralateral lung that further surgery is not required. In those cases in which extensive disease is in the lung segment on the opposite side, resection is performed six to nine months after the initial lobectomy. At the time of this surgery there is one main hazard; namely, cerebral anoxia due to the limited amount of lung available for respiratory function. This is prevented during surgery by keeping the tracheobronchial tree free of secretions and frequent expansion of the lung with positive pressure. This is followed by vigilant postoperative care.

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In bilateral bronchiectasis, with the plan of management as given, there will be an operative mortality of four per cent and a patient mortality of seven per cent as reported by Kergin[7] in 94 resections in 58 patients.

LUNG ABSCESS

The management of lung abscess has undergone revision since the advent of antibiotics. In chronic lung abscess external drainage has been superseded by primary lobectomy. This radical treatment is supported by lower mortality figures and the fact that external drainage will not correct the complications of bronchiectasis, multiple secondary abscesses, hemorrhage and perforation. The disease should be attacked while confined to one lobe rather than resorting to pneumonectomy after an entire lung is destroyed. This fact is emphasized in a report of 16 pneumonectomies by Glover and Clagett.[8] Of these, six died postoperatively, three died of brain abscess within five months, and three more presented serious complications with only 25 per cent having a good result; whereas, in their lobectomies for lung abscess, there was a 95 per cent good result. The underlying principle in managing acute lung abscess is drainage. If this can be accomplished by medical management through the use of antibiotics supplemented by bronchoscopic drainage so much the better, but such therapy must result in progressive disappearance of all symptoms and all roentgenologic findings. If this is not accomplished in the maximum period of six weeks then surgery is mandatory. If the patient is too toxic for resection, it is safest to perform external surgical drainage and follow later with resection. Touroff et al[9] in a large experience with lung abscess have reached the conclusion, after ten years observation, that in cases where antibiotic therapy promptly controls infection primary lobectomy or segmental resection is the procedure of choice. In managing a lung abscess, particularly with a medical regime in the patient past forty, the physician must be cognizant of the fact that 15 per cent of bronchiogenic carcinoma are manifest in this manner.

PULMONARY CYSTS

Congenital cysts of the lung while not primarily suppurative ultimately reach this complication. The fact that these cysts are found to occur in infants establishes their congenital etiology. They are sometimes associated with accessory lobes of the lung, and those occurring in the lower lobes frequently have an anomalous arterial supply.[10] These cysts are lined with bronchial epithelium and may be single or multiple involving a lobe or an entire lung. Although most commonly seen in children they may appear at any age, depending upon the advent of infection. Severe respiratory distress due to the size of the cyst may be the initial presenting symptom in infants. A large infected cyst may be mistaken for an empyema.

Once diagnosis has been established, the proper treatment is resection of the cyst containing segment of the lung. Lobectomy is well tolerated by infants and children. Ravitch and Hardy reported no operative mortality in 11 patients 13 weeks to 13 years of age representing ten lobectomies and one pneumonectomy.[11] Successful lobectomy has also been accomplished in a 15 day old infant.[12]

DISCUSSION

Frequent reference has been made to pulmonary resection in this summary of advances. This gives rise to the question often raised as to the degree of dyspnea after lobectomy. Fortunately, the remaining lung tissue has ability to compensate. A fact that has been demonstrated is that oxygen consumption following lobectomy may be normal provided chest wall and diaphragmatic function is good.[13] In some instances oxygen consumption is greater after surgery than that found preoperatively on bronchospirometric studies.

SUMMARY

Advances in the management of suppurative disease of the lung has been presented with discusion of improvements in surgical technic. Emphasis has been placed on early surgical resection of diseased segments.

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The Use of Anesthesia in General Practice*

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In a discussion of the use of anesthesia in general practice one must assume that a procedure requiring anesthesia will be carried out at least in an office, in a home or in a small private hospital. A consideration of the environment connected with the administration of an anesthetic is extremely important. There was a time when the physician carried out such procedures as were necessary and called upon any available person to assist him. This condition still exists in some places. Generally speaking, a physician in charge may anesthetize a patient with ether by the semi-open drop method, then ask any one available to continue to drop the ether on the mask and support the jaw while the physician prepares the surgical field and carries out the desired procedures.

When a physician is without assistance, he must rely on the administration of pain-relieving drugs such as morphine, methadone hydrochloride, dilaudid hydrochloride or some equivalent agent. These drugs may be administered intravenously, and they produce a definite effect. The physician may then employ a local anesthetic by infiltration, and there is little that cannot be done under this type of anesthesia. True enough, if the solution should be very strong in concentration or if the drug used is toxic, there is a lessening of the safety of the procedure as compared with that which exists when dilute solutions of relatively nontoxic agents such as procaine hydrochloride or metycaine are used. Generally speaking, a 0.5 per cent solution of procaine hydrochloride or metycaine administered by infiltration is satisfactory. A one per cent solution of either agent injected in quantity will make some patients show symptoms of toxicity which are recognizable by a fall in blood pressure, by slow pulse unless it is speeded up by epinephrine, and by twitching, dyspnea and anxiety. If two per cent solutions are used, the symptoms will be still more marked. If by some misfortune the symptoms become dangerous to life, one must be prepared to administer one of the commonly used barbiturates intravenously, which will control the convulsions and permit the patient to breathe.

In using a local anesthetic, one of the most important points of technic in order to avoid failure is the intradermal part of the injection. Deep infiltration by itself

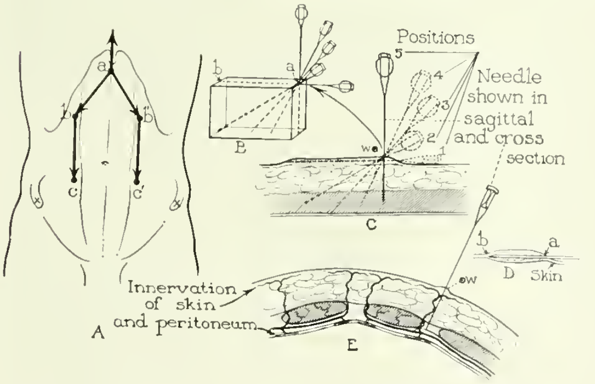
a
b
b'
c
c'
A
Innervation of skin and peritoneum
b
a
B
Positions
5
4
3
2
1
Needle shown in sagittal and cross section
w
C
b
a
D
Skin
w
E

Fig. 1. Abdominal wall block. *A*. Sites of injection; *a* to *b*, from the xiphoid process to the lateral border of the rectus muscle and, *b* to *c*, along its edge to a point about two fingerbreadths below the level of the umbilicus. This block can be used on the right side for a right rectus incision, but for an incision in the median line, bilateral block must be used, *a* to *b* to *c* and *a* to *b'* to *c'*. For most operations in the upper portion of the abdomen, regardless of where the incision is, bilateral block should be used. An injection from over the ensiform process of the sternum for a distance of three fingerbreadths, and penetrating from skin to bone, is carried out regularly because, in some cases, the incision may be extended upward as far as possible.

B. Brick-shaped portion of infiltrated tissue, the superficial surface of which, *a* to *b*, corresponds to the segments in *A* that lie between the small letters as well as to the segment in *D* that lies between the letters *b* and *a*.

C. Sagittal section of the tissue represented in *B* and *D*. The needle (80, 100 or 120 mm., usually) is shown in five positions. It is inserted in position 1, intradermally (*D*) and subcutaneously almost its whole length. The solution is injected as the needle is advanced; that is, an attempt is made to inject the solution ahead of the needle. At least two cc. of solution is injected in each position. Thus, a ten cc. syringe may contain enough solution to block a small, brick-shaped portion of tissue, a lateral view of which is shown in *B*. The amount of solution injected in the first position depends, however, on the length of the needle. Sometimes, ten cc. is required if the needle is 120 mm. long. The needle is partially withdrawn from position 1, until its point approaches wheal *w*. It is then re-inserted obliquely in position 2, so that the point of the needle penetrates the superficial fascia of the muscle but does not perforate the parietal peritoneum, and two or four cc. of solution is deposited in the muscular layer where the terminal branches of the intercostal nerves lie. The same procedure is followed in positions 3, 4 and 5. Such brick-shaped blocks, arranged in various patterns, result in various types of field block. The needle in *C* is the same as that shown in *E*.

D. The skin is blocked; the needle and solution are in place. It is this stretching of the skin in all directions which produces good surface anesthesia, and failure to produce such stretching is frequently the cause in unsuccessful block. It is this same stretching that produces the "orange-peel" appearance of the surface of the skin which is referred to in "Clinical Anesthesia."[1]

E. Cross section of tissue represented in *B* and *D*. The intercostal and other nerves to be blocked, that terminate in the abdominal wall, are shown in a heavy black line. (Reprinted from Balfour, D. C. and Eusterman, G. B.: *The Stomach and Duodenum*. Philadelphia, W. B. Saunders Company, 1935. Courtesy of publisher.)

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*Read at the meeting of the North Dakota State Medical Association, Grand Forks, North Dakota, May 29, 1950.

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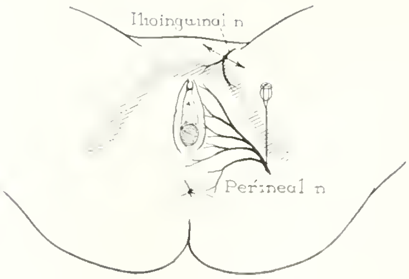

Fig. 2. Needle indicates the point of injection to interrupt the perineal nerve near the tuberosity of the ischium. The arrow indicates the line of infiltration when field block is also used. Bilateral injection usually is carried out. (Reprinted from Lundy.[1] Courtesy of the publisher, W. B. Saunders Company.)

will not permit painless incision (figure 1). An intradermal injection must always be made if the skin is to be incised. Various blocks can be employed to greater advantage in general practice. A simple block of real use in obstetrics is that of the pudendal nerve (figure 2). This block is carried out by depositing ten cc. of one per cent solution of procaine hydrochloride with a dilute solution of epinephrine medial to the tuberosity of the ischium. This injection produces a maximum of benefit and it can be repeated.

An intradermal and subcutaneous ring-shaped block at the base of the penis permits not only circumcision but any surgical procedure except amputation (figure 3). For operations on the hand or the digits, block may be induced at almost any point proximal to the area of operation by injecting the anesthetic solution intradermally and down to the bone. Particularly at the wrist and in the hand, one must pass the needle from the posterior aspect toward the palmar aspect of the hand, but one should not force the needle through the palmar aspect. In the digits, one may use a ring-shaped block proximal to the site of the operation, going from skin to bone (figure 4).

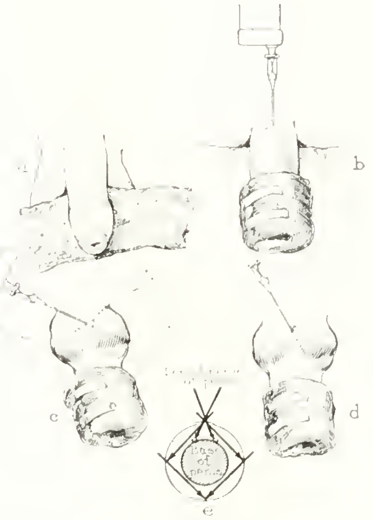

Fig. 3. Regional anesthesia (block) for circumcision; *a*, foreskin and adjacent portion of the penis are wrapped in gauze; *b*, a wheal is raised near the base of the penis; *c*, subcutaneous and intradermal injections are made around the entire base of the penis; *d*, the dorsal nerves of the penis are subjected to injection; *e*, cross section view of procedures shown in *c* and *d*.

For operations on the upper extremity, a brachial plexus block may be carried out and usually is not difficult if one locates the subclavian artery by pressure above the clavicle and until one cannot feel the ardial pulse at the wrist on that side. One measures the clavicle roughly and goes laterally from the medial end one-third the distance of the clavicle and raises the wheal a finger-breadth above that point. Insertion of a needle usually results in locating the first rib. Since the brachial plexus is superficial to this rib, one may infiltrate this area with two per cent solution of procaine hydrochloride or metycaine with epinephrine and satisfactory anesthesia of the forearm and hand will result. If the operation is on the upper part of the arm, one should inject a 0.5 per cent solution intradermally and subcutaneously so as to make a bracelet in the arm just below the axilla. If paresthesias are produced in the hand on placing the needle, anesthesia occurs very quickly with relaxation also. If paresthesias are not produced the needle may be superficial to the rib and fairly close to the subclavian artery. In that case, the brachial plexus may be blocked by gradual addition of more and more solution until that area is flooded (figure 5).

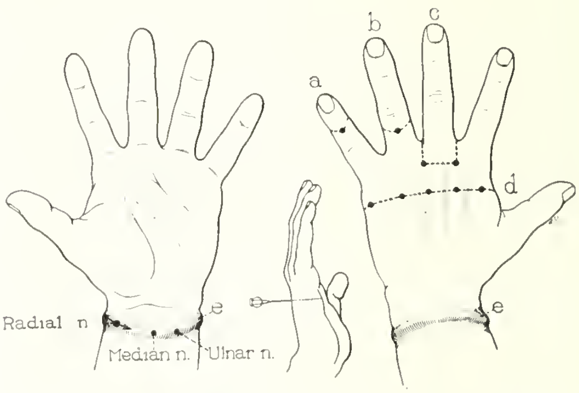

Fig. 4. Block anesthesia of the hand. Block for operation in the region (*a*) of the third phalanx, (*b*) of a second phalanx, (*c*) of a first phalanx including disarticulation of the metacarpophalangeal joint. *d*. Block across the hand to anesthetize four fingers. *Insert*, ulnar aspect of the hand, showing passage of the needle from the dorsum toward the palmar surface of the hand. *e*. Wrist block; intradermal and subcutaneous injection as a bracelet around the wrist. (Reprinted from Lundy.[1])

For operations on the scalp, one also must infiltrate the skin, the subcutaneous tissue and the periosteum. Any operation except an intracranial operation may be performed with this type of block (figure 6).

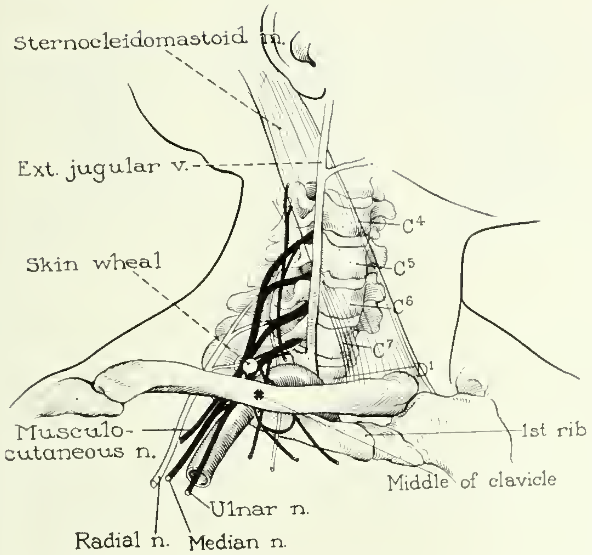

Fig. 5. Brachial plexus and its relation to the subclavian artery and other landmarks. (Reprinted from Lundy.[1])

For operations on the lower extremity, one may either infiltrate around all the area, or a small amount of spinal anesthetic may be employed. A subarachnoid injection at either the second or third lumbar interspace, by using procaine hydrochloride in a five per cent concentration as it leaves the syringe and in doses of not more than 100 to 150 mg., will produce excellent anesthesia of the lower part of the body from the umbilicus down for a period of thirty to forty minutes. It is well to administer 25 or 50 mg. of ephedrine intramuscularly at the time the local anesthetic is deposited into the spinal fluid, in order to keep the blood pressure from falling to a point where the patient cannot respond to questions. One of the most important technical points in getting the maximal effect from the drug that is to be administered in the subarachnoid is to be sure the hole in the lumen of the needle is within the spinal subarachnoid space and not partly in and partly out (figure 7). Not only must the tip of the needle be inserted fully but the needle must be held in such a way that its point will not be drawn alternately through the hole in the dura and arachnoid and then thrust partly back into the hole in the membranes while the syringe is being fastened to the needle and the injection is being made. Perhaps the needle may need to be rotated or advanced, or both. It is always easier to perform lumbar puncture when a patient is sitting up than when he is lying on his side. This is particularly true where assistance is lacking.

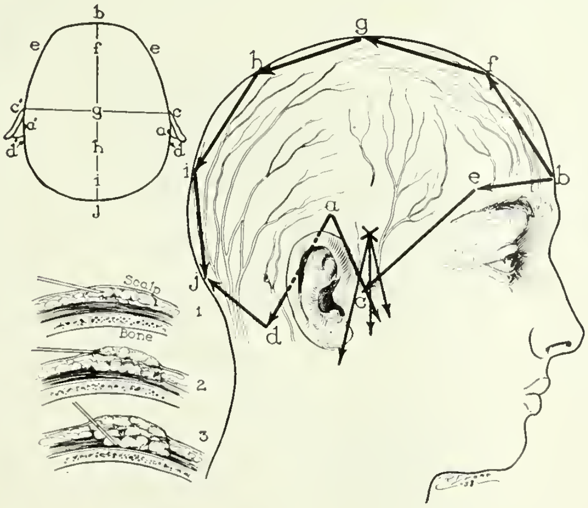

Fig. 6. Regional anesthesia (block) of the scalp carried out in segments illustrated by intervals between letters. The steps in injection of each segment are illustrated by the inserts; 1, subcutaneous injection; 2, intradermal injection; and 3, injection against the periosteum. For block of the right half of the scalp, the first wheal is raised at *a* and the second at *b*. The first two infiltrations carried out are *a* to *c*, *a* to *d*, *b* to *e*, *e* to *c*, *d* to *j* and *j* to *i*. The infiltrations *b* to *f* to *g* to *h* to *i* to *j* are the final step. The diagrammatic insert of the whole scalp indicates the various segments of the scalp that can be blocked, depending on the site of incision. About 200 cc. of a 0.5 per cent solution of procaine hydrochloride or metycaine to which epinephrine is added, is used. (Reprinted from Lundy.[1])

The procedures already mentioned, with the possible exception of spinal anesthesia, are useful if one is working alone or with little help. If more facilities and assistance become available, one may consider other measures. Administration of ether by the drop method has been mentioned and, since it is a familiar technic, it will not be dealt with here. The use of the gas machine, except under certain circumstances, becomes involved and almost always requires a skilled anesthetist.

Rectal anesthesia is not satisfactory. However, one may administer avertin with amylene hydrate or Pentothal Sodium by rectum, especially to children, in doses just sufficient to keep them from being noisy or aware of what is going on. For children, infiltration anesthesia may be utilized to advantage in addition to the sedative effect of the rectal instillation of drugs. Even the additional administration of small quantities of ether by inhalation will bring about satisfactory conditions as a rule. It is quite difficult, however, to do much with children if one is working alone.

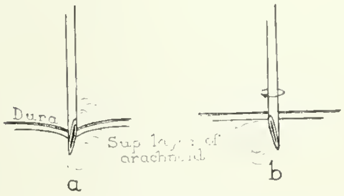

Fig. 7. Position of hole in lumen of needle; *a*, incorrect position, hole in lumen of needle is partly in and partly out of subarachnoid space; *b*, correct position for hole in lumen of needle. (Reprinted from Lundy.[1])

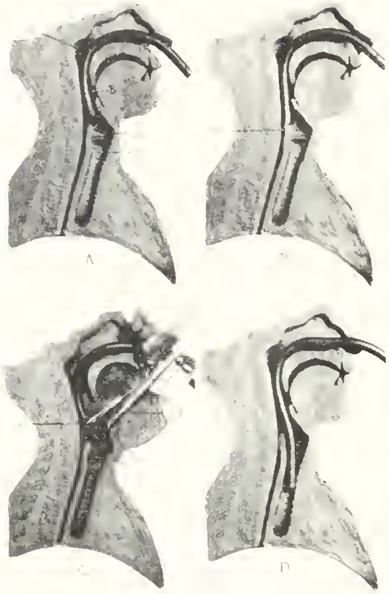

Fig. 8. Nasal intubation. *A*. The tube through the nose and nasopharynx (*a*) and extending well into the oropharynx (*b*); *c*, vocal cords; *d* trachea.

B. Tip of tube enters esophagus (*e*).

C. *f*, Laryngoscope, inserted through opened mouth, exposes glottis (*c*) and vocal cords, by moving the tongue (*g*), and epiglottis (*h*) out of the line of vision; *i*, Magill forceps grasps the tube near the tip and directs it into the glottis. (Reprinted from Lundy.[1])

D. Nasal tube properly placed, the tip lying midway between the glottis and the bifurcation of the trachea.

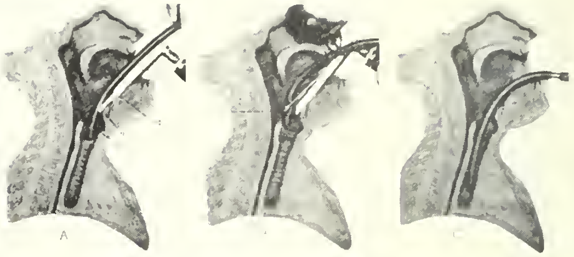

Fig. 9. Oral intubation. *A*. Laryngoscope and tube; laryngoscope (*f*) moves tongue (*g*) and epiglottis (*h*) so that the vocal cords (*c*) are exposed to view; the intratracheal tube is inserted along the blade into the glottis and trachea.

B. Same as *A* except that Magill forceps (*i*) direct the tip of the tube into the glottis.

C. Full-length intratracheal tube lying in place so that its tip almost reaches the bifurcation of the trachea. It is in this position that the tube must lie when the trachea has been compressed by an intrathoracic tumor (goiter). Note the difference in the placement of the tubes here as compared with that shown in figure 8*D*. (Reprinted from Lundy.[1])

The intravenous method of anesthesia is a most attractive one, but it also is dependent on facilities and personnel. Generally speaking, the intravenous administration of a 2.5 per cent solution of Pentothal Sodium requires little skill beyond venipuncture and conservatism in dosage plus slow administration. In some localities, the concentration of the pentothal sodium has been reduced to one per cent and the solution has been given by the slow, continuous drip method. This method can be used, but, generally speaking, is not as conservative as is a slow intermittent injection. Where one has relatively good facilities and assistance, it is not difficult to develop a technic for administering Pentothal Sodium and curare intravenously and administering equal parts of nitrous oxide and oxygen concomitantly with a gas machine. This combination is becoming increasingly popular throughout the country, and with some practice one can often produce operative conditions that are excellent. Patients do not object to this method, and there is little or no postoperative nausea or vomiting. There is one condition, inadequate pulmonary ventilation, which may arise, however, and that is due to the depression of respiration both from the Pentothal Sodium and the curare. In spite of the fact that 50 per cent oxygen is being administered, the airway may not be adequate so that good pulmonary ventilation does not exist. An airway is desirable. The ideal one is Magill's endotracheal tube. This, however, is not always easy to place since there are only two or three ways to do it (figures 8, 9 and 10). Under extraordinary circumstances, a tube has been placed with such an instrument as a divided airway.

Since facilities vary so much in the administration of anesthesia in general practice, reference to even some complicated device that is useful may not be out of place, as someone may see a use for it in his practice. It is possible to mix pentothal sodium and curare in a single syringe as advocated by Dr. J. W. Baird of Minneapolis.

Fig. 10. English divided airway; *a*, separated into its two parts; *b*, assembled; *c*, serving as guide for lubricated intratracheal tube (Divided Airway Co., London).

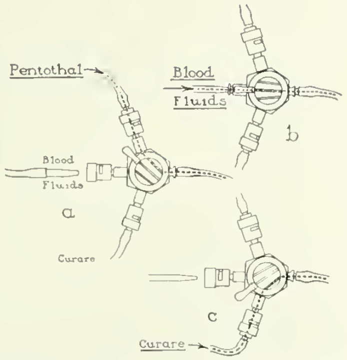

Fig. 11. Four-way connector for the simultaneous administration of pentothal sodium, curare and fluids or blood.

His mixture consists of five units of d-tubocurarine chloride and 25 mg. of pentothal sodium per cubic centimeter in water.[2]

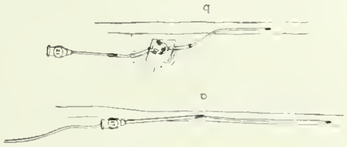

Fig. 12*a*. 17-gauge needle; *b*, small polythene tubing for intravenous use.

Recently I have been using a device which has simplified somewhat the effort to administer pentothal sodium from one syringe, curare from another, and blood or fluids through another channel. The stopcock, which might be called a "three- or four-way stopcock," can serve a useful purpose, provided that one wishes to go to the trouble to set up the personnel to use this device[3] (figure 11).

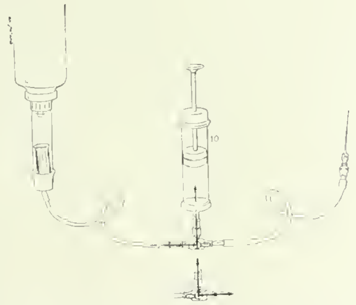

Fig. 13. A closed method used in forcing blood through a small 21 or 22-gauge needle.

Occasionally, one is faced with a situation in which veins might be extremely small, particularly in children or in debilitated persons, and the use of an indwelling plastic catheter or tubing in a vein serves a very useful purpose[4] (figure 12). The smallest polythene tubing that I have used has been passed through a 17-gauge needle into the vein, the needle withdrawn, the tubing fastened to the skin, a small gauge needle inserted in the end of the tubing, and this needle fastened to the tubing from the set that conducts the fluid from the bottle to the needle. Since the tubing is very small, fluids will flow through it rather well, but blood has to be forced through it with a syringe[5] (figure 13).

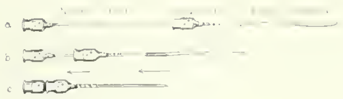

Fig. 14. Details of assembly of the plastic needle.

More recently, Dr. D. J. Massa, a fellow in anesthesiology in the Mayo Foundation, has developed a plastic needle (figures 14 and 15) which fits on the outside of a metal needle after insertion of which the metal needle is withdrawn.[6] This probably will be a considerable improvement over the older method of putting the catheter inside the needle. In some cases, it has been found best to leave a 17-gauge needle in place and use it for the administration of fluids and blood during operation and then, before the patient leaves the operating room, the tubing is inserted into the vein through the needle, and the needle is withdrawn.

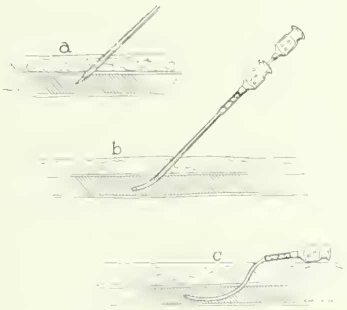

Fig. 15. Technic of venipuncture when plastic needle is used.

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Polypoid Adenomas of Rectum and Colon in Children*

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Fargo, North Dakota

The incidence of polypoid adenomas of the rectum and colon in children is not definitely known. It is generally agreed, however, that they are rather frequently encountered in childhood. It is the purpose of this paper to present some of the problems which arise in the detection and management of these lesions.

MATERIAL

During the past two years, nine children with polypoid adenomas of the rectum and colon were seen at the Fargo Clinic. Their ages ranged from one year, ten months to eight years. Seven were boys and two were girls. The principal symptom, rectal bleeding, was present in all nine. Duration of bleeding varied from one week to one year, with the majority having had blood in the stools for only a few weeks. A mass protruding from the rectum was seen by the parents in four of the nine children. No other complaints referable to the gastrointestinal system were elicited.

All of these patients were seen initially in the pediatric department. All were in good health and the general physical examination was essentially negative except that polypoid tumors could be palpated on rectal examination in four of the nine. The hemoglobin varied from 11.0 gm. to 15.2 gm. and was 12 gm. or below in five.

Proctoscopic examination of all patients was done as an office procedure. Rectal polyps were visualized in eight of the nine. Barium study of the colon, performed in seven of the nine, revealed lesions beyond the reach of the infant-sized sigmoidoscope in three.

The majority of these children had single polyps. Six had solitary polyps of the rectum. One was found to have a solitary polyp of the descending colon. One had three polyps—two in the rectum and one in the lower sigmoid. One had multiple polyposis involving the rectum, sigmoid colon, and cecum.

TREATMENT

All patients were treated in the hospital under general anesthesia. Proctoscopic examination was carefully repeated at the time of surgery. Of six patients with single rectal polyps, four had fulguration and two had suture-ligation and excision of the lesion. The length of hospital stay was less than two days in all of these. One patient with a solitary polyp of the descending colon underwent transcolonic excision of the polyp through a muscle-splitting incision. The hospital stay was seven days.

One patient required two proctoscopic examinations and removal of polyps under anesthesia. On proctoscopic examination in the office, this two-and-one-half year old boy was found to have a two cm. polyp on a long pedicle located five to six cm. above the dentate line. Barium study of the colon revealed a large solitary polypoid tumor just above the recto-sigmoid junction. Under anesthesia, two rectal polyps were discovered and fulgurated. Because of inadequate preparation, however, it was impossible to examine the sigmoid colon. It was hoped that the polyp seen by the roentgenologist was the same one seen and removed through the proctoscope, but repeat colon study proved this to be wishful thinking. At a later date the higher lesion, which also had a narrow pedicle, but which was located at 15 cm., was removed through the adult size sigmoidoscope with the loop snare.

Another patient underwent colectomy for multiple polyposis. This eight year old boy, who had had bleeding with bowel movements and protrusion from the rectum for several months, was found to have several rectal polyps on proctoscopic examination. On barium study of the colon, the roentgenologist reported multiple polypi in the sigmoid colon, a questionable lesion in the upper descending colon, and one in the ascending colon just above the cecum. At the first operation, the rectal polyps were excised or coagulated from below. Laparotomy was then performed. Several polyps were palpated in the sigmoid colon and one in the cecum. Ileo-sigmoidostomy was done. At a second stage, the colon was removed down to the rectosigmoid and the previous anastomosis revised from the end-to-side to the end-to-end type. This patient was in good health one and one-half years after operation.

Although the follow-up of these patients has not been as complete as desired, most have been re-proctoscoped at least once. No additional lesions have been discovered. There has been no known recurrence of bleeding. There has been no mortality.

PATHOLOGY

All tumors in this series were carefully studied by serial section. In no instance, including the patient with multiple polyps, was there evidence of malignant change. All were benign adenomas. Hyperplasia of the glands, inflammatory infiltration, edema, and surface ulceration were present frequently, particularly in the rectal lesions.

COMMENT

Kennedy[1] reports 49 infants and children with polyps of the rectum and colon seen at the Mayo Clinic during the years 1925 to 1940, inclusive. The great majority were seen after symptoms had been present from six months to three years. The nine patients in our series had symptoms for a considerably shorter period of time—most for only a few weeks. The physician must be prepared to investigate promptly and completely the cause of rectal bleeding in children.

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*From the Department of Surgery, Fargo Clinic, Fargo, North Dakota.

All children with rectal bleeding should have rectal and proctoscopic examinations. Children are notably less cooperative than adults. With the use of the ten centimeter infant size proctoscope, however, the examination may be performed as an office procedure with negligible risk. The 25 centimeter instrument may be used safely in children over two years of age. Sufficient help must be available so that the child may be held securely on the proctoscopic table and occasionally the administration of a sedative is desirable.

Some authorities feel that if a single rectal polyp is found on proctoscopic examination, barium study of the colon is unnecessary unless bleeding persists after removal. Kennedy and Dixon[2] report 11 cases of polypoid lesions of the colon in children which were above the reach of the sigmoidoscope. Six of the 11 also had polypoid lesions in the rectum. These investigators conclude that the presence of polypoid lesions in the rectum is an indication for roentgenological study. Since we have found lesions beyond the reach of the small proctoscope in three of the seven patients studied, we agree fully that the barium enema is essential in all of these patients. The difficulty in examining the child plus the difficulty encountered in the interpretation of the findings requires the help of an experienced roentgenologist.

The question of malignant changes in these polypoid adenomas is a controversial issue among pathologists. Kennedy[1] reports eight cases of adenocarcinoma, grade I, one case of adenocarcinoma, grade II, and one case of reticulum cell lymphosarcoma in 18 polypoid tumors of the rectum in children—an incidence of malignancy of 55 per cent. A later publication[2] reports nine adenocarcinomas ("grade I or low grade I") among eleven polypoid lesions above the reach of the sigmoidoscope. This incidence of carcinoma is much greater than most pathologists report. Almost all authorities agree, however, that adenomas of the colon and rectum must be regarded as pre-malignant lesions. This is particularly true of patients with multiple polyposis.

The child with one or two adenomas within reach of the procto-sigmoidoscope presents no difficult therapeutic problem. These are easily and safely destroyed by means of the snare and coagulating current or by ligation and excision. General anesthesia is required for children. Laparotomy and transcolonic removal of lesions above the reach of the sigmoidoscope is not difficult and mortality and morbidity are low. The patient with multiple polyposis, whether there is a congenital history or not, should have colectomy, since development of carcinoma is almost inevitable if the colon is not removed. An end-to-end anastomosis of the ileum to the rectum is preferable, since no new growth can be hidden from proctoscopic view at later examination. The rectum must be examined repeatedly for the duration of the patient's life and polyps removed and examined as encountered.

Abundant clinical data indicates that adenomas of the large bowel are likely to become malignant if untreated.[3,4,5] The thought also arises that the child with an adenoma has a greater chance of future development of cancer. For these reasons, we feel that these children should be studied repeatedly over the years. By the destruction of benign adenomas of the colon and rectum before malignant changes have developed, the mortality due to cancer of the large bowel can most surely be reduced.

Summary

1. Nine children with polypoid tumors of the rectum and colon have been diagnosed and treated during the past two years.

2. Rectal bleeding was the symptom which brought the parents to seek medical advice. All were proctosigmoidoscoped and lesions were discovered by this method in all but one.

3. Barium enema examination of the colon resulted in finding lesions above the reach of the small sigmoidoscope in three of seven such studies. Routine colon study is recommended for all children with persistent rectal bleeding, whether lesions are found in the rectum or not.

4. All tumors removed proved to be benign adenomas. Although no malignant changes were discovered in these nine patients, these tumors should be regarded as pre-malignant and destroyed. Equally as important as treatment of the adenoma is the need for repeated study, so that any new lesions may be treated before malignancy has resulted.

5. Treatment consisted of anoscopic or proctosigmoidoscopic destruction in seven (two attempts were necessary in one of these), transcolonic removal in one, and colectomy and ileo-proctostomy in one.

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> A surgeon must have hands well-shaped, with long, small fingers. He must have a body that does not shake, and be of subtle wit.
>
> — *GUIDO LANFRANC.*

A Brief Account of the Evolution of Antiseptic Surgery*

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Minneapolis, Minnesota

Surgical technique is never static. New procedures and new materials, such as plastics and metals, create fresh problems in sterilization. Although practices change, the basic principles of antiseptic surgery remain as constant as the laws of physics; and for the elucidation of these basic principles we are eternally indebted to Joseph Lister.

The conclusions of Oliver Wendell Holmes (1843)[2] and Ignace Semmelweiss (1847)[8] on the infectious nature of puerperal fever mark the high water mark of empirical thought in the study of surgical infections. Using a solution of hypochlorite to disinfect his hands, and exercising care in the personal hygiene of his patients, Semmelweiss was able to eliminate puerperal infection from his wards in Budapest. It is a sad commentary upon the medical minds of the day that these practices were not widely accepted and that the adoption of simple sanitary precautions was delayed for many years.

The pre-Listerian era was a time in which the surgeon's efforts were thwarted by suppuraton, purulent edema, hospital gangrene, erysipelas, and tetanus; a time when wounds and fevers were regarded as inseparable. In epidemic form hospital gangrene reached an incidence of over 80 per cent and forced the closure of large sections of hospitals. In Lister's own wards in the Royal Infirmary, Glasgow, the mortality rate for compound fractures was 45 per cent, a not unusual figure.

Lord Moynihan[6] has said: "A discovery is rarely a sudden achievement, nor is it the work of one man; a long series of observations each in turn received in doubt and discussed in hostility are familiarized by time and lead at last to the gradual disclosure of the truth." Discoveries in the basic sciences preceded and made possible the work of Lister. The theory of biogenesis, that life came only from life, was finally established upon the ruins of the theory of spontaneous generation. Louis Pasteur[5] demonstrated the role of bacteria in the processes of fermentation. He showed that bacteria were present in the air, and he kept fluids from decomposing by excluding dust and bacteria. Pasteur pointed out that fermentation and putrefaction were caused by living organisms found in the air, the dust and in putrefying media. In the absence of these organisms fermentation and putrefaction did not occur. The significance of these observations was immediately seen and acted upon by three surgeons with divergent results.

Spencer Wells, surgeon to the household of Queen Victoria, was a noted ovariotomist and practical surgeon. In a speech before the British Medical Association (1864)[9] he gave an accurate account of the discoveries of Pasteur, but understanding he did not have. Using as a simile the wind-blown plant seeds which take root here and there in favored places, he felt that airborne germs took root, too, only in optimal situations, the most favorable of all being the purulent wound. He concluded by describing a method of making the patient's body an unfavorable *milieu* for bacterial growth by the systemic administration of sulphites.

Jules Lemaire[1] repeated some of Pasteur's experiments in a haphazard fashion and showed that the addition of carbolic acid to organic fluids and tissue prevented putrefaction and fermentation. From this observation he was led to wash wounds with antiseptic lotions containing phenol. He treated wounds with antiseptics, but not antiseptically. He devised no principles of treatment, but applied his medicaments empirically to many diverse and unrelated conditions.

The impact of Pasteur's ideas upon Lister's mind led to a revolution in surgery. Why did Lister grasp the possibilities latent in Pasteur's observations when others had overlooked them?

Lister was the son of a Quaker merchant and a well known amateur microscopist. His medical education was begun at the University of London (1852) where he was particularly influenced by Thomas Graham, professor of chemistry, and William Sharpey, professor of physiology, from whom he obtained a solid grounding in the basic sciences. His first scientific contributions[4] were observations on the contractile tissue of the iris, on the muscular tissue of the skin (the first description of the *erector pilae* muscles) and on the minute structure of involuntary muscle fibers. From these, he turned to the study of inflammation, making direct observations on the web of the frog. He also studied blood coagulation. From such studies Lister gained a varied experience in research. For his surgical training he was indebted to Syme, the foremost teacher of surgery of the day, with whom he worked for eight years. Lister was a man with a wide interest and training in science generally, coupled with a practical knowledge of surgery. Only to such a man could the essential elements of Pasteur's work, in a then apparently unrelated field, appear to contain the solution to the problem of sepsis.

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*Presented to a Surgical Seminar, March 21, 1950, University of Minnesota Medical School.

†Department of Surgery, University of Minnesota Medical School.

Toward the end of 1864 while holding the Chair of Systematic Surgery at the University of Glasgow, Lister's attention was called to the papers of Pasteur by Thomas Anderson, professor of chemistry. After assimilating Pasteur's observations and ideas, Lister formulated these basic principles:

1. Germs must be prevented from getting into the wound during or after operations.
2. Germs should be killed outside the wound if possible.
3. If germs are present in the wound, they must be killed before they can spread and secure a foothold.

The search for methods and materials with which to accomplish these basic tenets occupied the remainder of his active life.

It is characteristic of Lister that his first action was to repeat carefully and to confirm the work of Pasteur. Not until he had familiarized himself with the nature and growth of bacteria did he assay to apply his principles to a clinical case. All laboratory procedures in bacteriology at this time relied upon sterilization by heat. Lister turned to the study of chemical compounds in the search for another method of killing bacteria. While groping in this direction he became acquainted with newspaper accounts of the sewage disposal arrangements of the town of Carlisle, near Glasgow. The sewage was distributed on the fields and the addition of a small amount of carbolic acid not only prevented the smell, but destroyed the entozoa usually infecting the cattle feeding upon these fields. Professor Anderson obtained samples of the crude acid, and later more refined material, for his experiments. Here we see the wonderful process of serendipity in the initial choice of carbolic acid, one of the most generally useful of all antiseptics, by both Lemaire and Lister.

Lister applied his antiseptic principles for the first time in March, 1865, on a patient with a compound fracture. He sterilized the air about the wound with a fine spray of carbolic acid solution. The hands and instruments as well as the ligatures were washed and soaked in the same solution. Then followed a long period of experimentation and improvisation of dressings and techniques for carrying out the antiseptic principles. The revolution did not come overnight. In 1867 his first papers [4] on the antiseptic principle in surgery appeared in *Lancet*. In eleven cases of compound fracture, five healed without any sign of infection. There was one death from secondary hemorrhage, a mortality of nine per cent, quite a contrast with the usual 45 per cent.

Lister's second paper on *The Germ Theory of Putrefaction* was presented in 1871. Four years later (1875) he gave an address on *The Effect of the Antiseptic Treatment upon the General Salubrity of Surgical Hospitals.* The culmination of his endeavors was his lecture before the International Medical Congress in London (1881) on *The Relation of Minute Organisms to Inflammation.* This period of twenty-three years represented a time of trial and error, of triumph and failure, of adoption and rejection of methods and materials. The result was an organized system of antiseptic surgery. Lister introduced the sterilization of all glassware and apparatus used in the operating room. He used the first sterile dressing and invented numerous pieces of equipment. His contributions to bacteriology during this period included a method for isolating organisms in pure culture, and the definition of the role of the lactobacillus in fermenting milk. Lister had derived the basic principles and developed the methods for carrying out antiseptic surgery. It remained to spread the knowledge and application of his discoveries.

The acceptance of the new ideas was slow, and the reasons for this are several. First of all, Lister's methods were cumbersome and complicated. Carbolic acid can be irritating to the hands and eyes. The spray and its acrid fog provoked opposition and was an easy target for ridicule. His methods were changing continuously. All sorts of materials were used for dressings and after a short trial discarded. Most of the articles which he used he made himself or had made locally for his special consumption, and were not generally available to other surgeons.

Secondly, there were several prominent English surgeons who, although not using Lister's methods, were able to obtain excellent results by scrupulous cleanliness and ordinary soap and water. Syme himself had reported a series of twenty mid-thigh amputations without a death. Thomas [7] abandoned Lister's methods after a thorough trial because they were too complicated and had not improved his results. Thomas depended upon the so-called "open" method for treating wounds coupled with absolute rest of the affected parts by means of splinting. Surgeons of the time sought to reduce the incidence of sepsis by improving general conditions in the hospitals, relieving crowding, properly spacing beds, and improving sanitary facilities.

Lister's ideas were accepted more quickly abroad than at home. German surgeons were acquainted with his work during his Glasgow period and rapidly applied his principles in the light of the newer knowledge of bacteria. In this way Lister's principles led directly to the development of aseptic surgery to which many surgeons made basic contributions. In America the introduction of Lister's ideas was promoted by his visit to the Centennial Exposition in Philadelphia (1876). W. W. Keen [3] described the effect of his visit upon surgical practice in America and was himself the first surgeon in Philadelphia to use his methods. By 1883 the leading surgeons in America, Willard Parker, H. B. Sands, Robert Weir, and W. T. Bull, were all advocates of Listerism.

It is a far cry from the simple carbolic spray of Lister to the complex chromium plated fixtures in our present-day operating suites, but the basic principles remain unchanged. To succeed in their application one need only to heed the advice of Lister [4] himself: "In order, gentlemen, that you may get satisfactory results with this sort of treatment, you must be able to see with your mental eye the septic ferments as distinctly as we see flies or other insects with the corporeal eye. If you can really see them in this way with your intellectual eye, you can be properly on your guard against them."

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A. C. H. A. News

George T. Blydenburgh, M.D., Ohio Wesleyan University, has accepted the chairmanship of the Committee on Administration.

* * *

William R. Nesbitt, M.D., of the University of Wyoming, has received orders for active duty in the Navy. Dr. Nesbitt has been chairman of the Committee on Local Sections.

* * *

Two positions in student health are available:

1. A woman physician is needed at the University of Massachusetts. For further information communicate with Dr. E. J. Radcliffe, director of Student Health.
2. Agricultural and Mechanical College Health Service located at Stillwater, Oklahoma, has an opening on its staff for a physician. Any interested man or woman should communicate with Dr. Roxie A. Weber, director of Student Health Service.

* * *

The following new directors of student health service have been announced: Leona B. Yeager, M.D., Northwestern University; William Lester, Jr., M.D., University of Chicago; H. L. Lawder, M.D., University of Illinois, and W. R. Mason, Jr., M.D., Emory University, Georgia.

* * *

The Illinois Section of the American College Health Association had a stimulating spring meeting at Northern Illinois State Teachers College in DeKalb, Illinois, with fifty-two members present. The morning program was devoted to problems in the small colleges and the student health service nursing personnel.

The afternoon program included the following scientific papers: "Athletic and other Common Injuries on the Campus," Dr. C. Howard Thatcher, University of Chicago, Chicago, Illinois. "Histoplasmosis in Illinois," Dr. William Beadenkopf, University of Chicago, Chicago, Illinois.

Other news items include: Dr. H. L. Lawder has been appointed acting university health officer, University of Illinois, Champaign, Illinois. Dr. William Beadenkopf resigned from the directorship of the University of Chicago Student Health Service intending to pursue further graduate study in epidemiology. Dr. William Lester, Jr., has been appointed his successor. Dr. Arnold Wagner resigned from the directorship at Northwestern University Student Health Service in April 1950 to engage in private practice. However, he is continuing as assistant director and remains active at the Health Service. Dr. Leona B. Yeager has been appointed to succeed Dr. Arnold Wagner.

DR. JOSEPH HOWARD BEARD

1883 - 1950

With the untimely death of Dr. Joseph Howard Beard on the first of April, 1950, the American College Health Association lost one of its elder and most distinguished members.

Dr. Beard was born January 12, 1883 at Linden Hill, Maryland. He received his B.A. degree from St. John's College, Annapolis, Maryland in 1902 and his medical degree from Johns Hopkins in the same year that he received his M.A. degree from St. John's College in 1912.

His entire medical career has been devoted to the service of the University of Illinois where he began his duties by organizing an isolation hospital in 1912. He came to the University by invitation to teach preparatory medicine and physiology in the Department of Household Science and later became Medical Examiner for the University of Illinois Civil Service employees.

His biography exemplifies the recognized need for college health service and the means by which such needs were met. His interest in students was noteworthy. Through the years many undergraduates came to him with their personal problems and he inspired all of them to seek greater heights of accomplishment.

He began his service to student health in the University of Illinois single handed and in the space of twenty-five years the staff grew to include nine men and four women physicians. Dr. Beard's interests were not limited to the university, however, for in 1938 he was honored by the Champaign-Urbana Community for his "intelligent advice and assistance in the establishment of the Champaign-Urbana public health district."

He was a fellow of the American Medical Association, a member of the American Public Health Association and Delta Chi Fraternity.

His biography serves to remind us of the generation of pioneers who foresaw the need for Student Health Service and labored to fulfill the need.

E. B. ERSKINE, M.D.
President, Illinois Branch
American College Health Association

The JOURNAL LANCET

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Great Northern Railway Surgeons' Association, Minneapolis Academy of Medicine, North Dakota State Medical Association, Northwestern Pediatric Society, South Dakota Public Health Association, North Dakota Society of Obstetrics and Gynecology and North Dakota Pediatrics Society

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Editorials

POOR MEDICAL CARE, A MAJOR HOSPITAL PROBLEM

All who seek hospital service are intent upon good medical care, and the first obligation of every hospital is to give it. This must be its declared or implied objective, for anything less would create a serious lack of confidence and patronage by the people of most any American community. However, something much less is given by many hospitals in this and other states and regions.

Poor medical care is what is wrong with these institutions and it is due, for the most part, to failure of physicians to limit their activities to what they can do well and to failure of hospital and other officials to see that they do it.

Basic principles of good medical care have been established for years by such organizations as the American College of Surgeons. Their Hospital Standardization program meets with universal approval but not with universal observance and that is where the fault lies. Their most recent annual report continues to emphasize the necessity of limiting staff physicians to what they can do well. It is alert to the urge possessed by many practitioners to engage in diagnostic and therapeutic procedures beyond their capabilities. It is well known that this is a deeply rooted evil which emphatically is not a trivial violation of the patients' right to good care. It is found in hospitals of all kinds so far as size, location, and rating are concerned.

The College Department of Hospital Standardization has given wide publicity to their program which, among other things, aims at preventing physicians from doing things which they cannot do efficiently. The need for competent medical supervision has been emphasized repeatedly here.

In view of the fact that so much has been said and publicized on this subject there can be no excuse for any person being ignorant of it who presumes to know anything about hospitals; certainly hospital officials cannot plead ignorance convincingly.

One may well wonder then why so much remains to be done to eliminate poor medical care or why official indifference to it remains so persistent. No doubt an unbelievable degree of callousness to it has developed through long years of exposure to it by the rank and file of our population including hospital officials. This appears to be the most logical explanation. We know that it is true with other serious evils which have been tolerated with little or no concern.

It is noteworthy that seldom if ever is poor medical care discussed by hospital officials. We hear them talk a lot about almost everything else except the best care their institutions can give their patients, care which should always be their primary consideration. Silence in this instance is ominous and indicative of little or no interest. This, of course, means no action, no correction of what needs to be corrected so badly.

Well trained and reliable staff members are necessary for good work in any institution, and they cannot be obtained at random. They must be selected and even then there must be organization and supervision of their work so that each one works at what he is capable of doing and gives a good account of himself.

Our school boards, for instance, know that not every applicant for a teaching position with a college degree and a license to teach is desirable; they know, too, that teachers must, for their pupils' welfare, restrict their activities to subjects in which they have satisfactory ability. No teacher, regardless of his training, is permitted to teach any subject in the curriculum; and all must teach under supervision.

But our hospital boards quite regularly make no selection of applicants for staff membership; they take any one who has an M.D. degree and a license to practice and make no provision whatsoever for the supervision of his activities. They restrict no one to what his knowledge and training entitle him to do; everyone is free to wander into any special field of practice he cares to without adequate or any training. The direct result of this *laissez-faire* attitude and action of hospital boards is the poor medical care and low standards of practice which are so prevalent.

It could not be otherwise when blundering work meets no protest and is tolerated with as much deference shown the offender as is given to those who place their patients' welfare first. Even fatal mistakes may pass unnoticed in official hospital circles although they are proved at autopsy to be inexcusable and repeatedly committed by the same physicians. These institutions which place all their facilities in the hands of any staff physician who wants to use them must be aware of the fact that they will not always be used competently and to the patients' benefit.

In this age of specialization and highly complicated technical procedures aided by special equipment which can be used satisfactorily only by exceptionally well trained hands there can be no excuse for permitting anyone to do anything he desires in any special field of practice. And yet, not only is this tolerated, but it is actually encouraged by some of our largest and best known institutions which have been on the approved list of hospitals for years.

Although they are pledged to provide diagnostic and therapeutic laboratory facilities under competent medical supervision they do just the opposite in these key specialties. They hire the part-time services of one or two of the members of their unselected staffs to act as trained and competent clinical pathologists and x-ray specialists atlhough they have had no formal training in these specialties.

They also compel all their patients who have laboratory work done to submit to the gross incompetence of these novices. Now everyone knows that poor and unreliable laboratory work is worse than none at all but these delinquent hospitals provide only this kind and realize a handsome financial profit from it.

There can be no question about who is primarily responsible for this particularly bad type of poor medical care but still the hospital retains its "fully approved" rating; strange as it may seem, this means that the representative of the College who has surveyed it finds that the delinquent hospital has met all the requirements of the standardization program and is carrying them out in an acceptable manner.

Satisfactory improvement will not be realized until officials in hospital service have more respect for the rules they make and hospital boards desire better things. Then they must delegate authority to their medical staffs to supervise and regulate properly the professional work of the individual members. Until this is done there will be no improvement and medical staffs cannot be blamed for it.

Angus L. Cameron, M.D.,
Minot, North Dakota

THE DOCTORS SPEAK

Last week every Minnesota newspaper, in common with every weekly newspaper in America, carried the first of a series of ads signed by the American Medical association opposing "compulsory health insurance." Many editors commented on the message and most, but not all, underscored AMA's message.

Our system of medicine could be improved, says E. R. Umpleby of the *Greenbush Tribune*, "but we are making progress and not under bureaucratic domination. The less the federal government dabbles in our personal affairs the better off we will be." John E. Casey of the *Jordan Independent* defends the doctor's right to speak out through an ad in his newspaper on the subject of medical service at the public expense.

James L. Markham of the *Hennepin County Review* at Hopkins is among the few editors to attack spending the 20 million dollars he says the AMA plans to spend on newspaper ads to fight President Truman's "national health insurance agency" as a "tragic waste." This agency the AMA calls "socialized medicine" but Markham wonders why they are not equally alarmed by "the health protection, the hospitalization facilities and the treatment given tens of thousands of veterans and their families" at government cost. Instead of fear doctors participate in this "enthusiastically."

Markham thinks the doctors "are being taken for a ride" by a press agent. "We say they are making easy marks of them because national health insurance is coming, just as certainly as the day after tomorrow, in good time. It is in the historical and economic cards and not all the slush funds of the Whitakers and Baxters, nor all the printers ink in the U.S.A. can stop it," Markham concludes.

Jim Vance of the *Worthington Globe* says his paper is glad to run the AMA ad. In his opinion "the American public at the present time is about as indifferent as could be toward any plan that would bring the whole medical profession under the control of government." He's had his experience as a veteran with government medicine and doesn't like it.

— *Minneapolis Tribune, October 19, 1950*

Notices

A special *cerebral palsy* teaching clinic will be held at Fargo, North Dakota on November 20 and 21, under the joint sponsorship of the North Dakota State Medical Association, the Public Health Department, the North Dakota Society of Crippled Children and Adults, and the Crippled Children's Services of the Department of Public Welfare. All referrals should be sent to Dr. D. T. Lindsay, medical director of the Crippled Children's Services, Bismarck.

A course on *poliomyelitis* will be presented at the University of Minnesota Center for Continuation Study on November 9 to 11, 1950 with the sponsorship of the Elizabeth Kenny Institute. The course is intended for general practitioners and for such specialists as pediatricians, physiatrists, orthopedic surgeons, and neurologists.

A course in *child psychiatry* will be held at the Continuation Center on November 27 to December 1, 1950. Lecturers and group discussions leaders are Dr. Ralph D. Rabinovitch, chief of Children's Service at the Neuropsychiatric Institute, University of Michigan, and Dr. John H. Waterman, director of the James Whitcomb Riley Guidance Clinic Indiana University Medical Center.

A course in *clinical chemistry* for internists, pediatricians, and general physicians will be held on December 7-9, 1950, with Dr. John T. Merrill of Boston, Massachusetts.

A course in *geriatrics* for internists and general physicians will be held on January 4-6. Visiting physicians include Dr. E. V. Cowdry, St. Louis, Missouri; Dr. William Dock, Brooklyn, New York; Dr. Nathan Shock, Bethesda, Maryland; Dr. E. J. Stieglitz, Washington, D. C., and Dr. E. L. Tuohy, Duluth, Minnesota.

A continuation course in *obstetrics* intended for general physicians will be presented on December 15 and 16. Visiting faculty members will include: Dr. Emil G. Holmstrom, University of Utah Medical School; Dr. Curtis J. Lund, Louisiana State University Medical School, and Dr. Charles E. McLennan, Stanford University Medical School.

The United States Civil Service Commission announces that the closing date for the acceptance of the following examinations has been extended as follows:

For Medical Officer (Rotating Intern), applications will be accepted until December 29, 1950.

By a previous amendment, the closing date for Medical Officer (Psychiatric Resident, Surgical Resident, and General Practice Resident) was extended until further notice.

News Briefs

North Dakota

BISMARCK will play host to two state medical conventions in 1951.

The announcement of the first of these meetings, that of the North Dakota State Medical Society, to be held May 19 to 22, was made at the regular meeting of the Sixth District Medical Society at Bismarck on October 6. The following committees to make arrangements for the convention were appointed by Dr. Charles A. Areneson, president of the Sixth District:

General arrangements—Dr. H. M. Berg, chairman; Drs. Carl Baumgartner, R. O. Saxvik, John Cartwright, Robert Radl, M. M. Heffron, and Leonard Fredericks.

Entertainment — Dr. Baumgartner, chairman; Drs. Myron Goughnour, G. R. Lipp, R. W. Henderson, W. H. Bodenstab, E. D. Perrin and P. L. Owens.

Hotels—Dr. Saxvik, chairman; Dr. R. R. Kling.

Registration—Dr. Cartwright, chairman; Drs. John R. Williams and E. H. Boerth.

Reception—Dr. Radl, chairman; Drs. W. B. Pierce, W. L. Diven and T. W. Buckingham.

Transportation—Dr. Heffron, chairman; Drs. Icenogle and J. C. McEwen.

The committee in charge of arranging the scientific program is composed of Drs. A. K. Johnson, Williston; J. W. Jansonius, Jamestown; V. G. Borland, Fargo; R. B. Woodhull, Minot; A. E. Haunz, Grand Forks, and C. H. Peters, Bismarck. This committee was appointed by Dr. Larson, who is president of the state society.

The next annual regional meeting of the American College of Physicians will also take place in Bismarck. More than 30 fellows and associates attended the fourth annual meeting in Minot the first weekend in September, when the Bismarck meeting was planned. Presiding was Dr. Robert Radl, Bismarck, governor of the association for North Dakota.

* * *

DR. WILLARD A. WRIGHT of Williston has been named as a member of the American Medical Association's committee on rural health. He replaces Dr. L. W. Larson of Bismarck, who was elected to the board of trustees of the A.M.A. last June.

* * *

DR. JOSEPH SORKNESS of Jamestown has been elected a trustee of Jamestown College. A second vice president of the North Dakota State Medical Association, Dr. Sorkness is a member of the North Dakota state board of medical examiners and the founder of the DePuy-Sorkness clinic at Jamestown.

* * *

DR. C. C. SMITH of Mandan was recently appointed district health officer of the Custer District Health Unit Board of Health. He will have the general supervision of the sanitary and public health nursing programs recently begun in the four-county area of Mercer, Morton, Grant and Sioux counties.

* * *

DR. W. H. WITHERSTINE, chief of staff of St. Michael's hospital in Grand Forks, was appointed chairman of the doctor's division of the St. Michael's hospital building fund drive. Dr. Witherstine broke the ground for the new hospital at ceremonies October 1 on the site near the University of North Dakota campus.

* * *

DR. OTTO CHRISTIAN GAEBE, who has served the people of his community for the past forty years, was honored at an Appreciation Day program at New Salem on Thursday, October 5. Ground was broken for a new modern playground to be named the "Dr. O. C. Gaebe Athletic Field."

* * *

DR. F. F. GRIEBENOW and Dr. George M. Constans were honor guests at a luncheon of the trustees of Bismarck hospital on September 19. Dr. Griebenow, a skin specialist, has been a member of the hospital staff for the past 40 years, and Dr. Constans has headed the EENT division since 1927.

New locations and appointments . . .

DR. BURRELL WAYDEMAN, formerly of Anamoose, will be associated in practice with Dr. L. J. Seibel at Harvey.

* * *

DR. W. S. POLLARD of Maddock has been appointed county health officer to complete the term of the late Dr. J. G. Vigeland.

* * *

DR. A. K. LEWIS, a graduate of the University of Illinois medical school and formerly with the Dakota Clinic in Fargo, has opened an office in Lisbon.

* * *

DR. JAMES BOUGAS, Bismarck, a 1948 graduate of Harvard University medical school, has assumed duties as assistant resident at the Presbyterian hospital in New York City.

* * *

DR. JOHN C. FAWCETT of the Lake Region Clinic, has accepted the position of district health officer of the newly formed Lake Region Health Unit. Dr. Fawcett was appointed by the district board of health for a five year term.

Minnesota

DR. JOHN J. BITTNER, director of cancer biology at the University of Minnesota and George Chase Christion professor of cancer research, was given the second annual Minnesota award of the American Cancer Society at the September 22 meeting of the Minnesota division of the society which was held at the Coffman Memorial Union on the University of Minnesota campus.

* * *

THREE outstanding retired professors of the University of Minnesota medical school were honored with a special conference on hypertension held at the University of Minnesota opening on September 18. These three were Dr. E. T. Bell, former head of the Department of Pathology, Dr. George E. Fahr, university teacher and

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medical chief of the Minneapolis General hospital, and Dr. Benjamin J. Clawson, also of the pathology department.

* * *

Over 120 doctors and other professional people attended the first of eight weekly University of Minnesota medical seminars for the Range area, held at Virginia on September 21. Virginia is one of six state areas which will hold seminars during the 1950-51 season.

* * *

Dr. Charles W. Mayo of the Mayo Clinic was the speaker at a scientific meeting of the St. Paul Surgical society on September 13. Dr. John Culligan is president of the society, Dr. Victor Hauser, vice president, and Dr. William F. Hartfiel, secretary-treasurer.

* * *

Dr. Viktor O. Wilson of Rochester is the new president of the Minnesota Public Health association. Other new officers are Dr. George A. Miners, Bemidji, first vice-president; Dr. Carl Kassel, St. Paul, second vice-president; Dr. C. G. Sheppard, Hutchinson, treasurer; and Dr. Dean Fleming, state health department, executive secretary. Dr. Clare Gates, Minneapolis, was elected to the board of trustees.

* * *

Dr. D. L. Sogge, a pioneer physician of Windom, was recently elected president of the Windom hospital staff.

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Dr. Wesley W. Spink, Minneapolis, a member of the United States Committee on Brucellosis, is chairman of the organization committee for the Third Inter-American Congress on Brucellosis which will be held in Washington, D. C., on November 6 to 10.

* * *

The following doctors trained in the Division of Dermatology at the University of Minnesota passed recent examinations of the American Board of Dermatology and Syphilogy: Stanley Huff, Melvin Grais, Robert W. Goltz, William Macauley, and Harold Hurst. Dr. Henry E. Michelson, of Minneapolis, is president of the board.

* * *

Dr. Kenneth Puresh, of Baxter, Iowa, and a graduate of the University of Iowa medical school, has joined Dr. John V. Carlson in practice at Westbrook.

South Dakota

Dr. G. J. Van Heuvelin, Pierre, who is health and welfare chairman in the South Dakota civil defense program, spoke on atomic bomb defenses at a meeting of the Huron District Medical Society at Huron on September 28.

* * *

The staff of the John Burns Memorial hospital at Belle Fourche recently honored Dr. J. L. Chassell on the occasion of his 79th birthday. Dr. Chassell, who has practised throughout his lifetime in the Belle Fourche area, was recently cast in the unique role of "contributing patient." While hospitalized himself for a period of several months he was able to continue to read x-rays for other patients undergoing examination at the hospital.

Deaths

Dr. Percy D. Peabody, pioneer doctor and founder in 1913 of the Peabody Hospital named for his father, Dr. H. A. Peabody, died September 6 at Webster, South Dakota. He had been a physician and surgeon in the Webster community for nearly 50 years and was a past president of the South Dakota Medical Society.

Dr. C. L. Wendt, 77-year-old pioneer South Dakota physician, died September 11, 1950, in Canton, South Dakota. A graduate of the Rush Medical school in Chicago, Dr. Wendt had practiced medicine in the Canton community for nearly 55 years.

Dr. T. D. Jones, of Aberdeen, South Dakota, died September 16 after a brief illness. A graduate of Rush Medical school in 1916, Dr. Jones practiced for many years at Bowdle and later at Chamberlain before moving to Aberdeen.

Dr. I. G. Davis died September 29 after 31 years of practice in Rushford, Minnesota. Dr. Davis was a graduate of Rush Medical school and served in the armed forces before coming to Rushford.

Dr. Alexander G. Dumas, Minneapolis, died October 2 at the University of Minnesota Hospitals. Dr. Dumas was clinical professor of psychiatry at the University of Minnesota medical school and former chairman of Governor Youngdahl's Mental Health Committee.

SURGEONS APPROACH TO THE PROBLEM OF ALIMENTARY TRACT MALIGNANCY

(Continued from page 419)

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SIGNIFICANCE OF TUMORS OF THE NECK

(Continued from page 428)

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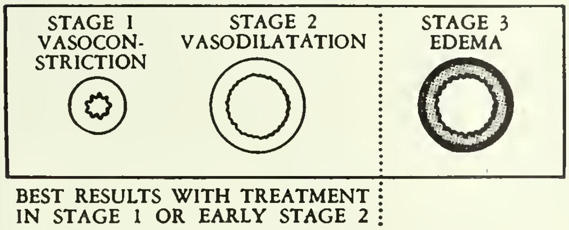
"Although E.C. 110 (CAFERGONE) was developed primarily for the relief of the migraine attack, it is uniformly effective and has a much wider range of usefulness in the relief of headache of all other types, especially typical and atypical histaminic cephalgia." (Hansel)(1)

For The First Time In Almost Two Thousand Years, clinical trials of an oral preparation indicate that migraine and other vascular headaches can be aborted in 85-90% of cases.

Although the cause of migraine is still unknown, the mechanism productive of head pain has been determined.(2) Today, it has been observed that the head pain in classical migraine and related disorders is produced through abnormal behavior of the cranial vascular system. The affected arteries, principally branches of the external carotids, become constricted in the early stage of the attack. Such vasoconstriction results in pre-headache warning signs such as visual and other sensory disturbances. Later in the attack, these arteries become relaxed and dilated. *At this point, agonizing headache begins.* Exaggerated pulsations and thickening of the affected arterial walls cause stretching of and pressure upon adjacent pain-sensitive structures. Headaches of this type may last for a few minutes only or they may last for days. Seizures are usually terminated by severe vomiting.



As a result of recent research, these headaches can be aborted for the great majority of sufferers. *Attention has been centered on the development of an effective oral preparation to relieve vascular headaches. Cafergone.* (100 mg. caffeine and 1 mg. ergotamine tartrate per tablet) *is the result of this research.* Ergotamine tartrate (Gynergen) has long been known as a potent vasoconstrictor. (3, 4) Caffeine, when administered orally, also acts as a vasoconstrictor.(5) Simultaneous administration of ergotamine tartrate with caffeine in Cafergone tablets has the added advantage of reducing the usual dose of ergotamine necessary to abort these headaches.(4)

These measures will abort vascular headaches for 85-90% of sufferers:(1, 4, 6, 7)

1. Give complete physical examination including ancillary tests to rule out other conditions mimicing migraine.
2. Advise the patient to re-organize his activities where possible.
3. Improve the general health of the patient.
4. Give 2 Cafergone tablets at first sign of impending attack and, if necessary additional 1-tablet doses (up to 6) at half-hour intervals.

For Subsequent Attacks: after the total number of tablets required for a patient's attack has been determined, give that total dose all at once for any subsequent attack of equal severity suffered by that patient. (Occasionally an attack returns due to inadequate dosage having been used; in such case repeat the dose and for any later attack adjust dosage accordingly.)

Literature available on request, for further particulars on *Dosage Adjustment* and other points:

Reprints of recent reports.
Therapeutic brochures.
Chart, "Clinical Characteristics of Vascular Headaches."

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Book Reviews

Cranioplasty, by David L. Reeves, M.D. Springfield, Illinois: Charles C. Thomas, 1950. 119 pages. Price, $3.00.

This complete and modern monograph on cranioplasty begins with a brief historical review of the subject. In the succeeding chapters there is a scholarly discussion of the various substances used in cranioplasty work along with the advantages and disadvantages of each. Operative techniques are described concisely. The author gives his personal opinion and experiences with the use of these procedures. There are also chapters on post-traumatic convulsive states and an analysis of the cranioplasty cases of the recent war.

The book is well illustrated and clearly written. The reader is left with no uncertainties concerning the values of the various materials and procedures. It should be of great value to anyone doing traumatic surgery.

L. A. F.

Supervoltage Roentgen Therapy, by Franz Buschke, M.D., Simeon T. Cantril, M. D. and Herbert M. Parker, M.Sc., Springfield, Illinois: Charles C. Thomas Co., 1950. 290 pages, 150 figures, 19 tables. Price, $8.50.

The authors have compiled their experience at the Tumor Institute of the Swedish Hospital in Seattle, Washington with the use of supervoltage roentgen therapy between 1935 and 1944. The apparatus utilized is the general Electric KXC-2 which was installed in 1932. This apparatus develops 800 kvp, which, with the filtration used, produces a beam with a half-value-layer of 3 mm.Pb. or 9.1 mm.Cu. Advantages of this type of radiation appear to be twofold: (1) Restriction of radiation to the geometric beam, and (2) Reduction of skin damage.

The authors present material including excellent discussion and typical case histories concerning the utilization of supervoltage roentgen therapy. No decisive advantage of supervoltage over medium voltage roentgen therapy was noted in carcinoma of the larynx, carcinoma of the breast, carcinoma of the cervix uteri, or pituitary adenoma.

An extensive discussion concerning treatment of carcinoma of the thoracic esophagus and bladder is given. The authors feel that the added increment of depth dose and decreased skin and systemic reaction with supervoltage therapy offers decisive advantages in curability of these tumors.

Throughout, a plea is made for earlier recognition of all types of tumors. Although supervoltage roentgen therapy has given us another useful tool in the treatment of cancer, the authors state that "further progress in radiation therapy will come rather from the application of existing knowledge to all patients who require it."

H. W. S.

Regional Dermatologic Diagnosis, by Ervin Epstein, M.D. First Edition. Philadelphia, Pennsylvania: Lea & Febiger, 1950. 320 pages, 148 illustrations. $6.00.

Dr. Epstein has attained his objective in producing a useful manual of dermatology for the general practitioner and student. It is a concise reference work for all nondermatologists who treat diseases of the skin.

Capitalizing upon the tendency for most skin conditions to be present predominately in characteristic regions, the author has divided the book into 31 chapter headings which indicate every area of the body. The entities in each chapter are presented under four sections: "inflammations"; "granulomas"; "tumors"; and "atrophies". Furthermore, at the end of each chapter is a table listing the chief findings for differential diagnosis, one column of which is labeled: "most important diagnostic feature." Three appendices outline briefly the "Location of Twenty Common Dermatoses"; "Outline of Local Therapy"; and "Cutaneous Manifestations of Internal Diseases."

This treatise will prove very workable and will facilitate the proper management of 75 per cent of the skin cases seen.

A. C. G.

Communicable Diseases, edited by Roscoe L. Pullen, A.B., M.D., F.A.C.P. 1035 pages, 253 figures, 35 illustrations and 20 color plates. Philadelphia: Lea & Febiger, 1950. $20.00.

This is a very comprehensive volume including every disease ordinarily considered communicable as well as others not ordinarily discussed in books on communicable disease. Emphasis is placed, where proper, on purely communicable aspects but each subject is presented with a complete discussion of the disease under consideration. Two good examples are the subjects of Rheumatic Fever and Brucellosis. Another example of the broad approach to the subject is the inclusion in the section on "Communicable Disease with Predominant Skin Manifestations" of the subjects of Mycetoma Pedis, Actinomycosis, Blastomycosis, Coccidioidomycosis and Histoplasmosis.

A rather fascinating appendix is entitled "Pediatric Procedures Helpful in the Management of Communicable Diseases." This concise appendix includes so much information, from dates of dentition fluid requirements of infants, artificial feeding formulae, diagnostic and therapeutic procedures in infancy and childhood, routes of administration of fluid and blood, treatment of diabetic acidosis, suggested pediatric prescriptions, all of great practical importance to the pediatric specialist and to anyone dealing with children.

The physical setup and illustrations are good and the printing makes for easy reading. The reviewer liked the contents index as well as the general index.

It is wholeheartedly recommended to every physician, although it is probably of greatest interest to the pediatrician, to the internist and to the general practitioner.

R. B. R.

Cerebral Palsy, by John F. Pohl, M.D. St. Paul, Minnesota: Bruce Publishing Co., 1950, 224 pp. Price, $5.00.

A great deal of information concerning a subject not too clearly understood by most practitioners is included in Dr. Pohl's new book on cerebral palsy. The book is a product of the author's study of 512 patients with this disorder seen in a 12-year period at the Michael Dowling School for Crippled Children in Minneapolis, Minnesota.

The first portion of the volume is devoted to a discussion regarding the characteristics and types of cerebral palsy. Complete statistics are included from a study of 144 children born with this disease in a 12-year period in Minneapolis. A general discussion of the treatment of cerebral palsy follows. Detailed descriptions are given on the methods used to secure muscular relaxation, teach voluntary muscular control and build developmental patterns. An excellent chapter on speech training concludes the book.

The book will be of particular interest to those specially trained to work with cerebral palsied children. However, for the general practitioner who is interested in this problem, it provides an easily assimilated, concise perspective of this disorder.

G. M. H.

Clinical Uses of Intravenous Procaine, by David J. Graubard, M.D. and Milton C. Peterson, M.D. Springfield, Illinois: Charles C. Thomas, 1950. Price, $2.25.

This monograph is well written and covers the fields in which intravenous procaine has been used very completely. It is evident that the judicious use of procaine is useful for many situations such as pain associated with changing of dressings and burns, pruritis, serum sickness, painful traumatic and inflammatory conditions, and acute arrhythmias both in the medical and surgical patient. The authors have also been careful to indicate the limitations and dangers associated with the uses of intravenous procaine. This monograph can be recommended highly and will find a useful place in the library of anesthetists and internists as well as that of surgeons.

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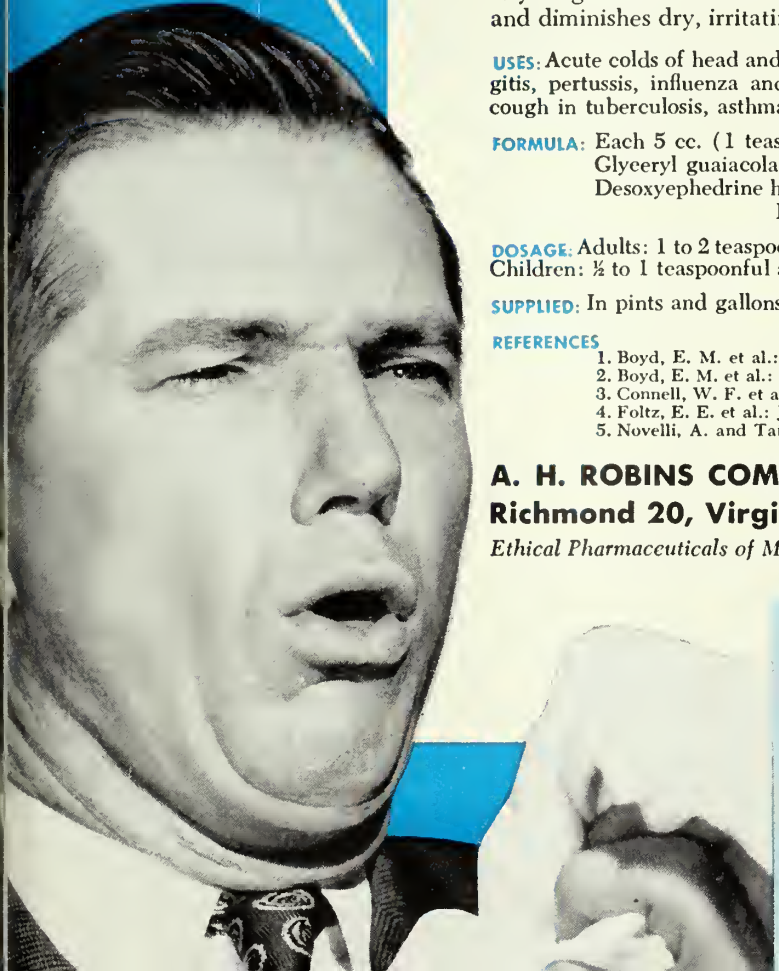

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The
JOURNAL
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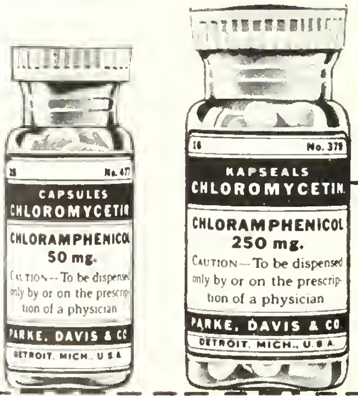

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The JOURNAL LANCET

Minneapolis, Minnesota
December, 1950

Vol. LXX, No. 12
New Series

Retraining Patients with Brain Damage*

Joe R. Brown, M.D.†
Rochester, Minnesota

History has long demonstrated that the nervous system, particularly the brain, plays a considerable role in human adaptation—an observation which assumes greater importance when applied to the adaptations of a disabled person. It is in order, therefore, to inquire how dissolution of brain function will enforce certain modifications in the rehabilitation program of a patient with an injured brain.

Theoretical aspects of the effects of brain damage which are amply documented in the literature will be outlined briefly as a background. The practical application of these principles, however, is based upon clinical observations and interpretations. The supporting evidence of illustrative cases is chiefly anecdotal and as such cannot be considered as proof. They are mentioned briefly and without documentation, merely to highlight the practical application of the principles involved. In any disabled individual there is the interplay of many factors in the final adaptation of the patient.[1] In this paper many personal, social and economic factors are intentionally disregarded in order to bring into sharper focus the effects of organic damage to the brain.

About 80 years ago Hughlings Jackson[2] recorded the essential psychologic and neurologic phenomena associated with injury to the brain. These observations were reinforced by the study of soldiers with head injuries in World War I. Following this there have been increasing contributions to this subject in the study of aphasic patients, spastic children, civilian and World War II head injury patients, and persons who had undergone prefrontal lobotomy. For the detailed observations recorded and for additional bibliography the following key references are suggested: Jackson,[2] Goldstein,[3,4] Strauss and Lehtinen,[5] Halstead,[6] and Mettler.[7]

Jackson[2] pointed out that destruction of brain tissue can produce directly only loss of function. All symptoms other than the negative ones of loss of function must result from the activity of remaining viable, functioning nerve tissue. These symptoms, the positive ones, are in part an expression of the release of "lower centers" from the control of "higher centers." For example, the spasticity, hyperactive tendon reflexes, and positive Babinski reflex in a case of hemiplegia represent a partial release of spinal reflexes from cortical control. In a broader and more inclusive sense, some of the positive symptoms must be considered as an attempt by the total individual to establish a satisfactory new adjustment within his limited abilities. Thus certain postures and movements of the head and eyes may be assumed to compensate for visual field defects. This compensation apparently may even include the shifting to a new central fixation point when field defect splits macular vision.

It now appears clinically that the presence of damaged but viable brain, by virtue of its locally impaired function may adversely affect the functioning of the "whole brain." In selected cases such as those with epileptogenic foci, the removal of the damaged, malfunctioning area has resulted in greatly improved total function. In the majority of instances, however, the symptoms seen in cases of brain damage must be considered to result from a combination of the loss of function, the release of lower mechanisms, and an attempt at over-all compensation and readjustment.

---

*Read at the meeting of the American Medical Association, San Francisco, California, June 26 to 30, 1950.

†Department of Neurology and Psychiatry, Mayo Clinic, Rochester, Minnesota.

In the presence of organic brain damage, psychologic functions undergo a process which Hughlings Jackson named "dissolution," the opposite of evolution. The highest functions of the nervous system are those which are *most flexible, most complex* and *most voluntary*. The person with a damaged nervous system has a relative loss of these highest functions and must resort to the *more simple, more organized, more automatic* mechanisms remaining. This process of dissolution or dedifferentiation can be readily observed when the nervous system is subjected to the depressing effect of alcohol. The most complex conceptual processes disappear first, leaving a level of behavior which responds to the psychic stimuli of the moment. The nervous system is shallower, the top is lower, there is less of the person. As the depressant effect progresses, consciousness is lost and behavior is reduced to the level of reflex responses to noxious external stimuli. Such responses are simple, stereotyped, highly organized and automatic. The last activities to be suppressed under these conditions are the simplest, most organized, most automatic cardiovascular and respiratory functions. It is apparent from the illustration used that the process of dissolution or dedifferentiation is a continuum, but for convenience of exposition it is helpful to speak as if there were actually different states or levels of neural function.

It is worthy of note that the concept of dissolution applies equally well to sensory, motor, conceptual, integrative and emotional faculties. Actually these faculties are markedly interdependent. "No one ever touched anything without moving his fingers. No one ever saw anything without moving his eyes."[2] It is equally true that having touched and seen, having moved fingers and eyes, we all then interpret the experience: place it in a category (abstract); integrate it into our background of experience; modulate our emotional response to it; and make an adaptive response. These four abilities—to abstract, to integrate, to modulate emotions, and to select adaptive responses—form the basis for our higher intellectual abilities or adaptive intelligence. Halstead[6] pointed out that these abilities closely correspond to the psychoanalytic concept of the ego. In the patient with brain damage the adaptive intelligence (or ego, if you will) has been subjected to dissolution or retrogression. His behavior is dominated by the immediate situation and immediate affective influences with less regard for the future. The available range of use of symbols is limited, and responses are on a more concrete plane. Perceptions and behavior tend to be stereotyped. The patient has a fixed mental set and cannot tolerate variations from the usual without undue anxiety. In order to understand better the effects of these defects in adaptive intelligence, it is helpful to consider them somewhat separately.

The *ability to abstract* and the capacity to symbolize include the recognition of essential similarities in the light of apparent differences, and in the converse the recognition of essential differences in face of marked physical similarity. This means finding a common denominator and relating things in the proper categories, as well as recognizing time and space relationships. In its highest form, it includes the ability to utilize symbols effectively to replace the concrete objects.

Perhaps a concrete illustration will clarify this point. A short time ago, my son, aged two years, saw for the first time the battery from a pen-sized flashlight. He picked it up, felt it, put it in his mouth, took it out, pounded with it, and looked at it some more. Perhaps his first thought was that it belonged to the category of round, long things such as stick candy, crayons, and so forth. He tested the feel, the taste, the noise it made. Thus he knew it was hard like metal. He then discovered the red sealing wax tip; so he tried it on his lips as if it were lip rouge. At this point he was happy because he had decided, albeit incorrectly, what it was. In this experience he behaved much like an adult with a damaged brain. The normal adult is able to interpret and categorize a new experience, and give the experience a name or a value without being bound too closely to the concrete sensory impression (touching, tasting, smelling, pounding). He is even able to achieve a "mental image" of a projected experience by hearing or reading symbols (words) which describe the experience.

The patient with a damaged brain has reduced ability to trace resemblances and differences. His difficulty in keeping in mind simultaneously two or more aspects of the situation leads to the characteristic of distractibility. He is slow to grasp the *essential* features of a given situation. Consequently he is insecure and anxious on approaching a new problem. The strangeness of the unknown leads to anxiety and, to defend himself against this anxiety, he voluntarily decides ahead of time how to solve the problem. Because of the limited range of responses available, this fixed mental set forces the patient to interpret a new experience in the light of what he *expects* to perceive rather than his actual perceptions. Once he has solved the problem to *his* satisfaction he has difficulty in accepting and shifting to a different approach. This leads to rigid, stereotyped, perseverating behavior which is mixed with distractibility in a patient who becomes slow and confused in complex situations.

Retraining a person with brain damage requires an attitude of increased patience on the part of the therapists and the family. Retraining should begin early because it is difficult to change unfavorable habits which have become fixed. Directions should be simple and direct, using a minimum of unnecessary words. The retraining should proceed slowly and be kept within the abilities of the patient Sudden changes, complicated situations, or failures will produce confusion and anxiety which retard recovery.

Integration of new experiences into the background of life experience requires the ability to learn (or relearn) the new as well as remember the old. By comparing the newly experienced and newly learned with the remembered older knowledge it is possible to form judgments for the immediate present and for the future.

The patient with a damaged brain is defective in his ability to abstract, and he may have more or less faulty memory for events in the recent past. These factors combine to make available to him only faulty information concerning his environment and himself. Despite this inadequate information, the patient with brain damage must form judgments in order to protect himself against the unknown which provokes anxiety and insecurity. He is in the same unenviable position as the physician who is *forced* to establish a *specific* diagnosis and set a *definitive* course of treatment despite misleading clinical and laboratory data. It is apparent that under such circumstances defective judgments and faulty decisions are unavoidable. This fact is of considerable clinical importance because it requires an attitude of tolerance and patience on the part of all who attempt to treat the brain-damaged.

The modulation of emotional responses of the moment in the interest of satisfying future needs is a characteristic of the intact mature person. The infant, with his poorly developed powers of abstraction, integration and judgment, acts on a stimulus-response basis and expresses vehemently his feelings of the moment. As the child progresses, he develops his ability to abstract, his capacity to project in time and space, and his powers to evaluate and form judgments. At the same time he develops increasing control over the emotional urges of the moment.

With organic damage to the brain, because of diminished ability to abstract and project into the future, the emotional responses become increasingly governed by the stimulus of the moment. In responding to the feelings of the moment, patients with brain damage tend to be unadaptive, capricious and impulsive. They may be quick to anger or stubborn at one time and overly affectionate a moment later. Euphoria may alternate with depression. Because of failure to appreciate the possible future importance of a situation there is a trend toward indifference and apathy. There is less concern about inaccuracies when faced with a task. With mild brain involvement there is shallowness, irritability and carelessness.

In the management of mood changes in such a patient it is well to recognize that outbursts of irritability are generally short-lived and there are times when the patient is more amenable to suggestions. It is generally wise to be permissive when a patient is obstinate and later to attempt to win his co-operation. Similarly outbursts of laughter or crying should be met with calm consideration. The gradual development of the desirable simple routines of self-care and ambulation, and the slow resumption of social contacts will generally alleviate the emotional outbursts. The load should be progressive but should never exceed the patient's capacity at the time. These patients, because of their relatively intact vocabularies, are generally assumed to have near normal adaptive abilities. Therefore, it is of singular importance to estimate the actual limitations imposed by the brain damage.

Selecting adaptive behavior is the final step in the psychic processes we have been discussing. It seems self-evident that the functions of abstraction, integration and emotional control are literally means to an end. That end is adaptive response which the person makes to his environment. The exteriorization of adaptive intelligence may take many forms, but the three obvious channels utilized are through motor performances, through sensory modalities, and through physiologic concomitants. The exact mode of expression will depend upon an interplay of constitutional, developmental and situational factors which are beyond the scope of this discussion. The normal person has a relatively great flexibility and a relatively large *selective choice* of adaptive behavior. He is usually not forced to utilize the more automatic and stereotyped neural mechanisms. In contrast to this, the person with brain damage is peculiarly deficient in his ability to *select voluntarily* his adaptive responses. Difficulty in making abstractions results in efforts at substitution. For example, instead of calculating "in his mind," such a patient must resort to the simpler, concrete mechanism of counting on his fingers. Once he has accomplished a reasonably satisfactory solution to the problem, he utilizes that solution for other problems even though it does not apply (perseveration). He has difficulty in shifting voluntarily to a new situation (rigidity, stereotypy). Because new situations and new stimuli do not now have the same significance for him the span of attention is poor and he is distractible. For the same reasons he may pay undue attention to "irrelevant" stimuli and appear absent-minded.

An example of this rigid stereotyped behavior is furnished by the patient with a left hemiplegia who learned to walk on his own initiative. He used a Canadian cane with the right arm leaning far over to the right. In effect the cane became his right leg and the right leg substituted for his left. Ambulation was slow and clumsy. Verbal directions concerning his gait led to utter confusion although he understood directions about other things. Similarly the patient was unable to copy gaits and movements actually demonstrated to him. Even prolonged and slow training attempts failed to break down the rigid pattern which had been established. This highlights the importance of early training in acceptable habits.

Patients with brain damage are unusually susceptible to anxiety and frustration. If such patients have been severely frustrated they may withdraw from any and all efforts at readjusting or meeting a new experience. Goldstein[3] has spoken of this as a "catastrophic reaction." Under such circumstances *any* experience becomes an overwhelming threat. In milder instances, in order to defend themselves against anxiety, patients may resort to neurasthenic, hypochondriacal or hysterical complaints. In other patients, depression or a hostile resentful attitude may similarly represent a defense. The rigid stereotyped behavior described previously is also used as a protection against such anxiety. These symptoms require a careful study of the patient in reference to the limitations imposed by his brain lesion as well as his personal, family and economic problems. The therapist must assume a calm, sympathetic, quietly encouraging attitude. The tasks must be well within the patient's ability to perform, so that he may receive the encouragement of a successful performance. The program of therapy should be slowly progressive to lead the patient, yet always remain within his ability to perform.

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THE DOCTOR AND THE NATIONAL EMERGENCY

". . . . Soon after the beginning of the Korean conflict, Congress authorized the armed forces to call upon their Reserves to effect the necessary expansion. On 10 August 1950, the Army placed its first call for medical officers with the Army Commanders. This call was for only 734 physicians. At about the same time the medical profession of the United States endorsed legislation to require service of physicians who were trained at Government expense, or those who did not serve in World War II. This legislation was in the form of an amendment to the existing Selective Service Act. It was passed by the Congress and became Public Law 779 on 9 September 1950. This law placed former ASTP and V-12 participants and those deferred to pursue medical education during World War II in first priority for service. On 16 October they were registered by the Selective Service System. The President has directed that this group of young physicians be utilized before calls are made on those who served in World War II. Before the President's directive had been promulgated, the Army had already decided that it could reduce the number of Reserve officers with World War II experience by aprpoximately one-half. In fact, the original 734 call was reduced to 364. But since the President's letter cancelled even this call, special authority had to be obtained to order 130 company grade officers, and 149 field grade officers to duty to meet urgent demands that could not await the implementation of Public Law 779. All company grade officers were notified with their orders that they would be released from the service and allowed to return to their homes as early as possible, probably in January or February. This same provision does not apply to the field grade officers, who are the commanders and the specialists required for positions of responsibility. In addition, the Navy has loaned the Army 570 physicians until replacements can be obtained.

". . . . In endorsing legislation calling for draft of physicians, the medical profession undoubtedly, after consideration of all means whereby it could support the armed forces, decided that the least disruption to the physicians of the Nation would be caused if the Priority I and II groups would be called first. It now appears that approximately 85 per cent of these young physicians are in some type of residency training in hospitals throughout America. Many hospitals, in surveying their numbers who fall within these groups, have found that one-half or more may be subject to service under the law. Many feel that their teaching programs will be severely handicapped, and some are of the opinion that their medical care programs actually may suffer. Both conditions would be true if all Priority I and II physicians were called into service immediately. While figures are not available at the present time, it would seem likely that one-half of the residents who fall into Priority I and II of the law might be called to duty within the next six or eight months. Teaching hospitals should immediately prepare themselves to meet this loss. Our experience in the Army has indicated that it can be met, although, of course, it does require additional effort on the part of many individuals. But we believe that our experience indicates that this can be done without severe disruption.

". . . . The physician in the current emergency must come to the realization that his profession must render support to the armed forces during their mobilization for the defense of our country and our way of life; that he should support and sponsor a strong, well-trained regular medical component in the armed forces to take as much of each initial impact as possible; that he should make his plans for his career to include at least one tour of duty in his Nation's armed forces; that he should impress all those entering the profession from the medical schools to so plan their personal careers so that a call of their country will not forever disrupt their professional lives; and last, that he must strive continuously to maintain a firm integration of military and civilian medicine in order that all segments of the profession may advance in harmony and in unison."

—Excerpts from "The Doctor and the National Emergency," by PAUL I. ROBINSON, Brigadier General, M.C., U.S.A.

Subarachnoid Hemorrhages and Intracranial Aneurysms*

Lyle A. French, M.D. and Paul S. Blake, M.D.
Minneapolis, Minnesota

Approximately 40 per cent of all patients with a spontaneous subarachnoid hemorrhage die in the first attack and about 40 per cent of the survivors expire due to recurrent attacks some time within the following five years. Two per cent of all cases of sudden death are ascribed to subarachnoid hemorrhages. These hemorrhages occur principally from ruptured aneurysms located on the great vessels at the base of the brain and the bleeding is primarily into the subarachnoid space, although laceration of cerebral tissue may occur. In the typical case the patient has a sudden onset of extremely severe headache, rapidly becomes stuporous or comatose, develops nuchal rigidity due to blood in the subarachnoid space, and may or may not have signs of focal brain damage. A lumbar puncture usually reveals grossly bloody cerebrospinal fluid. Up until the present time the prognosis has been poor. However, during the past few years progressive improvements in diagnostic and therapeutic procedures have occurred and the outlook has greatly improved. This report concerns the experience gained at the University of Minnesota in treatment of 69 patients with subarachnoid hemorrhages and 18 additional patients with intracranial vascular abnormalities but who did not have a subarachnoid hemorrhage.

The clinical entity of spontaneous subarachnoid hemorrhage has been recognized for over a century (Wilks,[20] Gull[8]). Froin[7] in 1924 divided cases of subarachnoid hemorrhage into three types: (1) cerebromeningeal (primary intracerebral hemorrhage with rupture into the subarachnoid space), (2) primary subarachnoid hemorrhage, (3) meningocerebral (primary subarachnoid hemorrhage extending into adjacent cerebral tissue). This division has been of utmost clinical importance in explaining the sequence of symptomatology. Subsequently, there have been numerous reports in the literature stressing symptomatology (Ingvar,[10] Symonds,[19] Sands[16]); pathology (Forbus,[6] Richardson and Hyland[14]); and treatment (Wolf, et al,[21] Strauss and Tarachow,[18] Schorstein,[17] Dandy[4]).

Incidence

Subarachnoid hemorrhage is a disease of young adults although it has occurred in a 28-day-old infant (Noran[13]) and in persons over 80 years of age (Richardson and Hyland[14]). The age incidence of 1012 cases collected from the literature appears in Fig. 1.

There is no predilection according to sex.

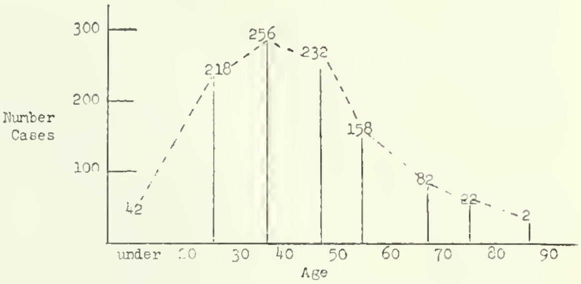

Fig. 1. Age incidence of subarachnoid hemorrhage.

Etiology

Subarachnoid hemorrhage may occur secondary to an intracerebral hemorrhage (cerebromeningeal hemorrhage of Froin[7]). In this instance subarachnoid hemorrhage is rarely due to rupture of an aneurysm but rather follows rupture of a sclerotic vessel within the substance of the brain.

Spontaneous hemorrhage occurring primarily into the subarachnoid space is felt to be due to rupture of an aneurysm in almost all cases. There are other causes such as rupture of a cortical angioma, rupture of a sclerotic vessel within the subarachnoid space, blood dyscrasia and toxemias, but these are infrequent. In some cases the etiology of the hemorrhage is never determined on clinical grounds and postmortem examination may reveal no definite cause. Most investigators believe these latter cases are due to ruptured aneurysms. Schmidt[15] emphasized that inability to locate an aneurysm did not exclude its existence. Symonds[19] demonstrated that subarachnoid hemorrhages of unexplained origin are often due to aneurysms that are not ordinarily found at autopsy because these aneurysms are minute and the remaining shreds of the ruptured aneurysm are buried deep within the blood clots.

It has long been realized that the aneurysmal dilatation or sac occurs at a weak area in the vessel wall. Eppinger[5] pointed out that this weakness was congenital and due to defects in the elastic tissue of the vessels. Subsequently, it has been demonstrated that the defects in the elastic tissue occurs at the apices of the angles formed by arterial branching or bifurcation. Forbus[6] showed that these defects occur as frequently in children as in adults. He also emphasized that since aneurysms are rarely found in children, another factor besides the congenital defects must be existent in the pathogenesis of the dilation. He also demonstrated physiologically

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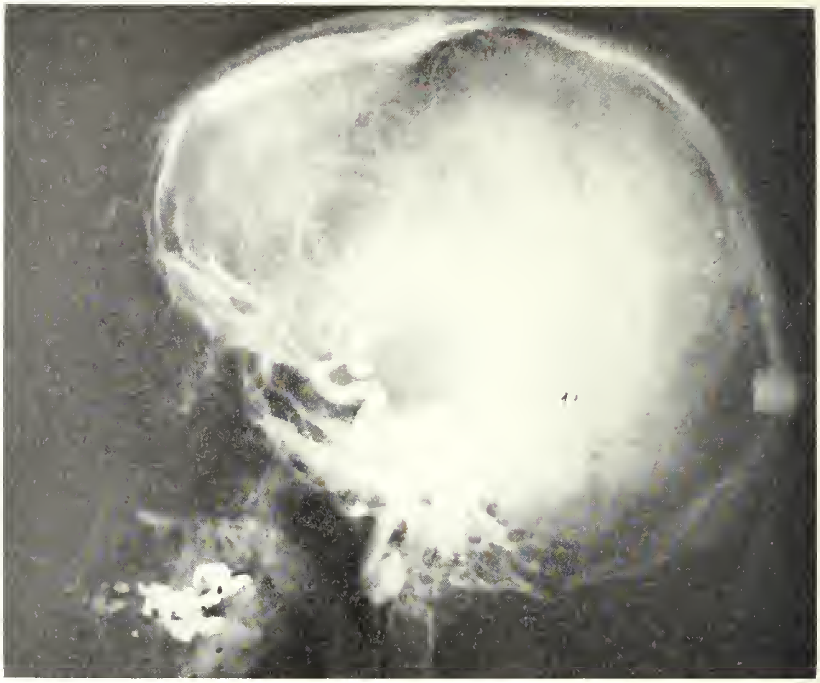

Fig. 3. Aneurysm of internal carotid above dural reflection and below origin of posterior communicating artery. Clinically this patient had signs and symptoms of subarachnoid hemorrhage without localizing signs.

that increases in blood pressure were greatest at the points corresponding with the bifurcation angles in the arteries and suggested that the evolution of aneurysms in such areas is largely due to mechanical factors consisting of an increased intravascular pressure normally developed at the bifurcation exerted against a congenitally weak arterial wall in the same area. Dandy[1] agreed that most aneurysms were of congenital origin as described by Forbus[6] and others, but he did not believe that they could occur only at the bifurcation of vessels where the various investigators had found the defects in the vessel wall. He studied the embryogenesis of the intracranial vascular tree and concluded that these congenital defects could also occur at sites where embryonic vessels or vascular buds had developed but later disappeared. Subsequently, others (Bassets[3]) have agreed with him.

SYMPTOMS AND SIGNS

The clinical manifestations in patients with subarachnoid hemorrhage can be divided into two groups: (1) generalized manifestations due to increased intracranial pressure and to blood diffused throughout the subarachnoid space and (2) focal manifestations due to local involvement of structures either by the hemorrhage or by the aneurysm. The site and the amount of the hemorrhage determines the sequence and the severity of symptoms produced.

GENERALIZED MANIFESTATIONS

The onset of symptoms is usually abrupt but occasionally mild premonitory symptoms of headache, vertigo, visual disturbances and ataxia may exist for several hours or days. They are probably due to recurrent small leakages from the aneurysm or a gradual process of enlarging of the aneurysm by stretching and recurrent hemorrhagic dissection in the wall of the sac.

The most common initial symptom is a generalized excruciating headache which tends to predominate in the occipital region and down over the back of the neck. Occasionally it may be more localized in one region and frequently it is accompanied by vomiting. Sudden loss of consciousness is the initial symptom in a lesser percentage of patients but occurs frequently enough to require that subarachnoid hemorrhages be ruled out in

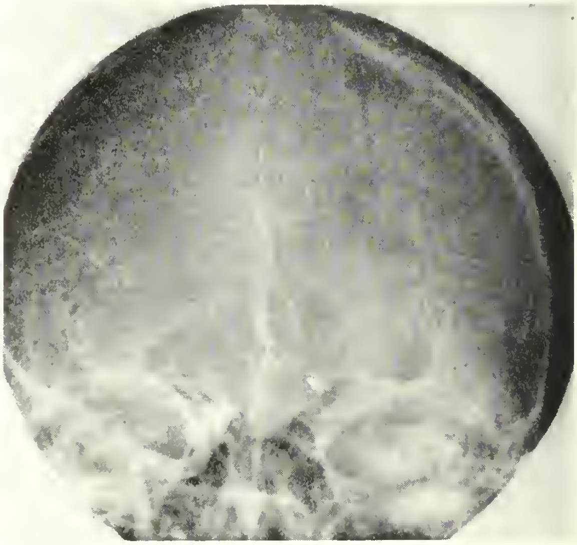

Fig. 4. Same patient as Fig. 1. Postoperative AP angiogram done on opposite side. This patient had the internal carotid artery ligated in the neck and later a silver clip placed intracranially on the internal carotid artery thereby trapping the aneurysm. The postoperative angiogram reveals the position of the clip and the maintenance of collateral circulation through the circle of Willis.

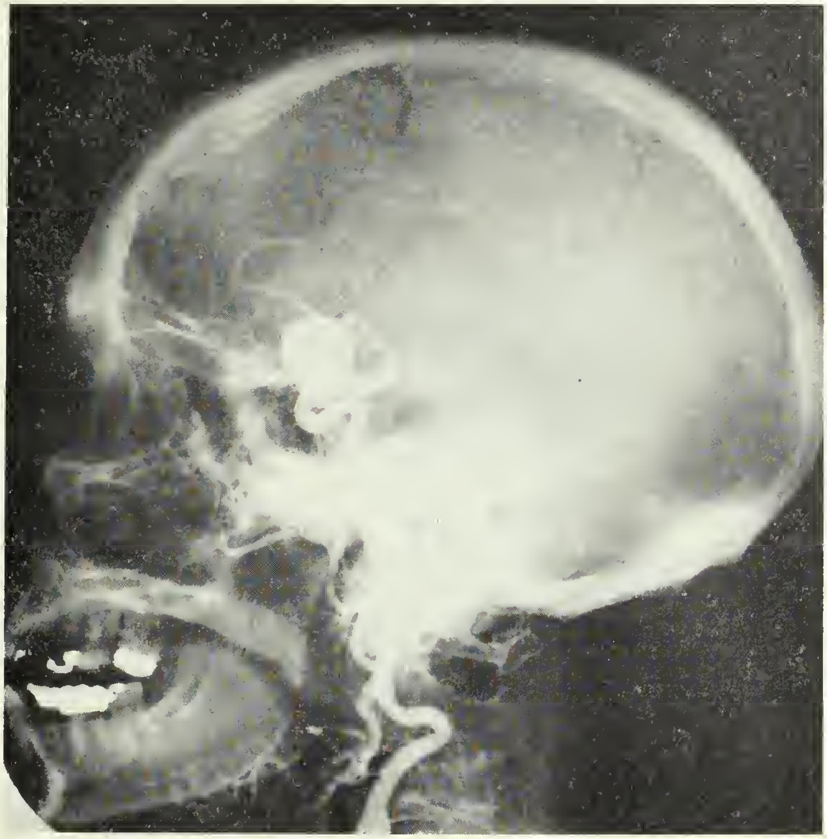

Fig. 5. Large saccular aneurysm on internal carotid above the dural reflection. This 70-year-old lady had blindness in the right eye and right-sided facial pain for ten years.

patients seen in this state. Other symptoms that rarely occur as the initial manifestation but often occur at some time during the illness are vertigo, visual disturbances, convulsions, irrationality, chills, speech disturbances, and pains in the back and extremities. The general signs due to blood spreading throughout the subarachnoid space are similar to those of an aseptic meningitis. They include stiff neck, mental retardation, generally diminished reflexes, low grade fever and leukocytosis. Spinal puncture performed immediately after the hemorrhage may reveal no evidence of blood unless the hemorrhaging vessel is in the posterior fossa in which case the blood will extend rapidly down to the lumbar region. Spinal puncture performed six or eight hours after the onset of hemorrhage will almost certainly show evidence of blood in the lumbar spinal fluid. The spinal fluid in subarachnoid hemorrhage has three characteristics: (1) an even admixture of blood with the cerebrospinal fluid in all three collecting tubes, (2) absence of coagulation, and (3) xanthochromic supernatant fluid. None of these features is noted in cerebrospinal fluid contaminated with blood by accidental injury to veins while performing the puncture. Early in the course of the disease the proportion of leukocytes to erythrocytes in the spinal fluid is similar to that in the blood. Later there occurs a rise in the proportion of leukocytes and at first this rise is due to an increase in polymorphonuclear cells and later due to a rise in lymphocytes. The xanthochromia usually becomes manifest 24 hours after the initial bleeding. It can occur as soon as 12 hours or may be delayed for three or four days. Gross blood usually disappears from the spinal fluid within 14 days and the cerebrospinal fluid returns to normal usually within four or five weeks. The ophthalmoscopic abnormality characteristic of subarachnoid hemorrhage is a subhyaloid extravasation of blood which occurs in ten per cent of cases. The blood in the subarachnoid space dissects forward in the optic nerve and appears above the retina as a solid sheet of blood. Papilledema also occurs in about ten per cent of cases which low incidence is surprising insofar as the majority of these patients do have increased intracranial pressure. This discrepancy is explained by the fact that blood clots are found about the optic nerve and these clots block the perineural spaces around the nerve preventing the transmission of the increased intracranial pressure to the venous drainage of the retina.

Unruptured aneurysms may enlarge and cause severe neurological symptoms when they are located in certain regions. Such aneurysms on the internal carotid artery running through the cavernous sinus classically cause a unilateral ptosis, dilated pupil, and ocular imbalance due to pressure upon the oculomotor nerve. If the aneurysm is sufficiently large it may impinge additionally on the trochlear and abducens nerves resulting in complete ophthalmoplegia. Such aneurysms rarely rupture into the subarachnoid space to produce the syndrome of subarachnoid hemorrhage because the dural envelope of the cav-

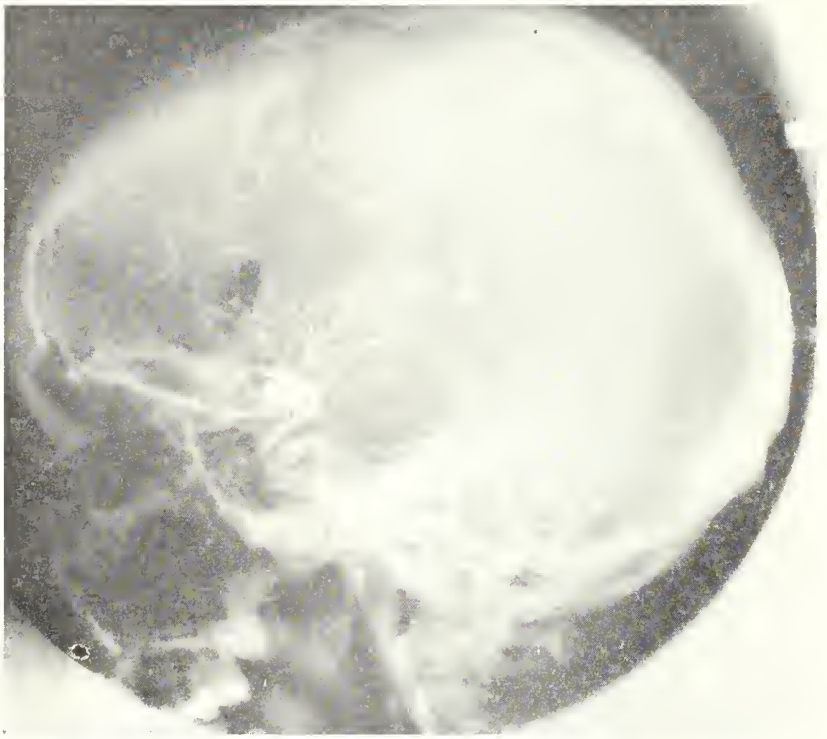

Fig. 6. Aneurysm of right middle cerebral artery. This patient had a sudden onset of subarachnoid hemorrhage with left hemiparesis.

ernous sinus reinforces the expanding aneurysm thereby preventing rupture. On the other hand, an aneurysm upon the internal carotid artery above the dural reflection, that is, lying unsupported in the subarachnoid space, is prone to manifest itself initially by a sudden onset of subarachnoid hemorrhage (Fig. 3). If an aneurysm in such a location happens to expand to a great degree without rupturing, it will impinge on the optic nerve producing field defects or loss of vision in that eye (Fig. 5). Only rarely will it involve the nerve supplying the eye muscles or the trigeminal nerve as do aneurysms within or below the cavernous sinus. Aneurysms located out on the anterior cerebral, the middle cerebral (Figs. 6 and 7) or the posterior cerebral artery rarely cause symptoms unless rupture occurs. However, aneurysms on the posterior communicating or basilar arteries sometimes produce symptoms from pressure on the adjacent cranial nerves and brain stem. These unruptured aneurysms can rarely be differentiated from small intracranial neoplasms without angiography or surgical exploration.

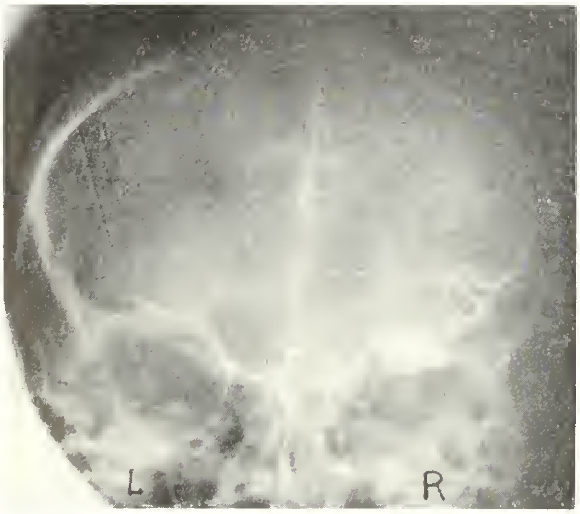

Fig. 7. Same patient as Fig. 4, demonstrating the importance of the AP angiogram in localizing an aneurysm of the basilar vessels. Since this was located in the non-dominant hemisphere, a craniotomy was undertaken and the whole aneurysmal sac extirpated from within the Sylvian fissure. The patient recovered but remains hemiparetic nine months later.

The most frequent sites of occurrence of intracranial aneurysms are well established. In Table II is shown the location of 608 aneurysms collected from the literature as well as 46 aneurysms in the University of Minnesota series.

TABLE II

Collected Cases

Location	Number	Per cent
Ant. Comm.	92	13.6
Ant. Cerebral	63	9.9
Ophthalmic	3	.6
Middle Cerebral	168	25.2
Int. Carotid	170	25.6
Post. Comm.	23	3.9
Post. Cerebral	18	3.3
Basilar	103	15.3
Sup. Cerebellar	1	.2
Ant. Inf. Cerebellar	5	.9
Post. Inf. Cerebellar	8	1.5
Total	654	100.0

In rare instances aneurysms may rupture and the blood may remain confined to the region immediately surrounding the vessel, even to the extent that no evidence of the hemorrhage can be detected in the lumbar spinal fluid. Focal signs and symptoms from such a hemorrhage are similar to those described above for large unruptured aneurysms. Frequently when aneurysms rupture the blood extravasates through the surrounding brain tissue; this occurred in 70 per cent of Richardson and Hyland's[14] series and Gull,[8] Albright[1] and Symonds[19] have correlated, with some success, the sequence of symptomatology produced from intracerebral extension. They found that hemorrhages extending into the frontal lobe may occur from aneurysms located on the anterior and middle cerebral and from the anterior communicating arteries. Such bleeding may actually extravasate into both frontal lobes and produce severe psychic disturbances. Involvement of the posterior part of the frontal lobe produces a contralateral hemiparesis and if the hemorrhage is in the dominant hemisphere, an expressive type aphasia may result. Hemorrhage extending into the temporal lobe usually arises from a ruptured aneurysm at the bifurcation of the carotid artery or along the middle cerebral artery. An aphasia may develop if the dominant hemisphere is involved. Extension of the hemorrhage posteriorly into the temporal lobe can cause visual field defects. The hemorrhage may even dissect medially into the internal capsule and produce a hemiplegia with both motor and sensory impairment.

Prognosis

The prognosis in patients with subarachnoid hemorrhage has been poor relative to both morbidity and mortality. The mortality of the initial attack as reported in the literature varies from 30 per cent to 50 per cent. Those institutions whose patients come from a wide area have a lower initial mortality presumably because many cases expire on the way to the hospital or are deemed too ill to transport and they expire at home. The average mortality rate for the initial attack in over 500 cases collected from the literature was 44.3 per cent. At the University Hospital, 28 of the 69 cases of subarachnoid hemorrhage seen were in the initial attack. The mortality rate for these 28 cases was 32 per cent.

If the patient survives the initial attack, the probability of a recurrent hemorrhage is great. In 603 cases collected from the literature 51.5 per cent had recurrent attacks. These recurrences varied from the first day to several years after the initial attack. The greatest frequency of recurrences is between the second and fourth week as indicated in Fig. 2.

The mortality rate for the recurrent attacks has been reported by Wolf[21] to be 40 per cent, by Magee[11] to be 64 per cent and by Hamby[9] to be 72 per cent. In the University of Minnesota series the mortality rate for recurrent attacks was 34 per cent. There are certain factors which have been found to affect this mortality rate, one of which is very strict adherence to prolonged bed rest following the attack. It is believed that this is a factor in the comparatively low mortality in the University of Minnesota series. There are certain factors which have been found to affect the prognosis unfavorably. They are (1) history of previous attacks, (2) multiple hemorrhages while in the hospital, (3) mental disturbances, (4) unconsciousness, (5) convulsions and (6) hypertension. In the University of Minnesota series there were 40 patients who were unconscious during the attack and of these 55 per cent died. In the same series there were 21 patients with hypertension of which 45 per cent died. Factors that do not seem to affect the mortality rate were activity at the onset, premonitory symptoms, and presence of severe neurological signs.

Sequelae following subarachnoid hemorrhages are frequent and oftentimes severe. For the University of Minnesota Series these are shown in Table I and are compared with 21 cases in whom operation was performed for an intracranial vascular lesion. Interestingly enough the incidence of sequelae was essentially unchanged, but the mortality rate in the operated cases was greatly reduced.

Table I

Subarachnoid Hemorrhage—Sequelae

	Without Surgery (66)		With Surgery (21)	
Sequelae	Number	Pct.	Number	Pct.
Hemiplegia	7	15.8	3	15.0
III N. Palsy	—	—	2	10.0
Blind	—	—	1	5.0
Aphasia	2	4.5	—	—
Convulsion	2	4.5	—	—
Psychotic Behavior	2	4.5	—	—
Headache and Vertigo	6	14.7	—	—
Homonymous Hemianopia	1	2.2	—	—
Deaths	22	33.	1	4.9

Treatment

Improved diagnosis resulting from greater knowledge of the clinical syndromes, cerebral angiography, and a greater understanding of the surgical management of intracranial aneurysms are responsible for improvement in the methods of treatment in patients with subarachnoid hemorrhage. However, all patients are not operated upon so that medical management is of utmost importance. These include: (1) Bed rest—not less than six to eight weeks, surely not less than four weeks after the patient has been free of such symptoms as headaches, stiff neck and vertigo. (2) Sedation—enough to control restlessness but not enough to cloud the mental state or to suppress respiration. Adequate sedation with barbiturates, paraldehyde or chloral hydrate permits control of headache with codeine or aspirin. (3) Hypertonic solutions—intravenously to diminish intracranial pressure is of doubtful value, but may be of assistance in patients who are going progressively downhill. (4) Elevation of the head—probably of value in decreasing intracranial blood pressure and, hence, may assist in clotting of the bleeding point. (5) Spinal drainage—a spinal tap is usually performed to make a diagnosis but whether repeated spinal drainage should be undertaken as a therapeutic measure is a greatly debated point. Frequently patients will be relieved of headache for several hours after a lumbar puncture. Merritt[12] believes that the intracranial pressure should be reduced to one-half the normal two or three times a day for the first three to six days following the hemorrhage and then once daily for as long as there is evidence of blood or increase in the cerebrospinal fluid or increased intracranial pressure. However, Ayer[2] believes that spinal drainage is contraindicated insofar as a reduction of intracranial pressure might permit prolonged bleeding. The policy at the University of Minnesota is to do a spinal tap for diagnosis, and only in the occasional case with otherwise uncontrolled headaches or restlessness are repeated spinal punctures performed.

At some period during this conservative regime it is necessary to investigate the patient further in regard to the existence of an aneurysm. Angiography should be undertaken. The question that arises is just when is the optimum time for the angiography. It is now well recognized that angiography can be accomplished without significant mortality or morbidity even in patients of precarious general condition. In short, the trauma of angiography is so inconsequential that it should not delay the procedure. However, it is of little value to ascertain the exact location of an aneurysm if the general condition of the patient precludes any operative interference. Therefore, angiography should be performed no sooner than one can feasibly perform a craniotomy. Until the patient is in good enough condition for operation, there is no justifiable reason to perform angiography. As a general rule, patients with subarachnoid hemorrhage are in good enough condition to withstand operation within a few days after the hemorrhage.

The second question that arises is how long may one safely procrastinate before definitive investigation and therapy are instituted. In an attempt to answer this, cases were collected from the literature and tabulated in Figure 2 in which the interval before recurrent hemorrhage occurs is shown. It is obvious that the frequency of recurrences is greatest beginning the second week after the initial hemorrhage. Therefore, angiography should be performed as soon after the hemorrhage as the patients can possibly tolerate an operation and should not be delayed beyond the second week after hemorrhage. To delay longer invites disaster.

It is imperative that a determination of the circulatory capabilities of the cerebral vessels be made. The collateral circulation through the circle of Willis must be investigated. The easiest method of accomplishing this is digital compression of the carotid artery in the neck (Matas test). Dandy stated that in his experience digital compression of the internal carotid artery in the neck for ten minutes without symptoms such as dizziness, paresis, or sensory changes never failed to indicate correctly whether the vessel could be ligated safely. It has been our policy to occlude the surgically exposed carotid artery in the neck for ten to 20 minutes prior to consideration of ligation. Even with this practice, the advent of neurological sequelae are not entirely eliminated because these can also result from vascular thrombosis in the occluded artery. There are two principal causes for cerebral complications secondary to carotid artery ligation: (1) cerebral ischemia from inadequate collateral circulation through the circle of Willis, and (2) progressive cerebral vascular thrombosis and embolism. In the former, the symptoms usually develop during the ten to 20 minutes that one digitally compresses the artery (the value of the Matas test), and in the latter the symptoms develop 12 to 48 hours after ligation. In Dandy's series of 105 ligations there were less than four per cent immediate complications and less than two per cent late complications. At the University of Minnesota 17 ligations have been performed with two (11 per cent) immediate and one (five per cent) late complications. In all these patients the sequelae were transient.

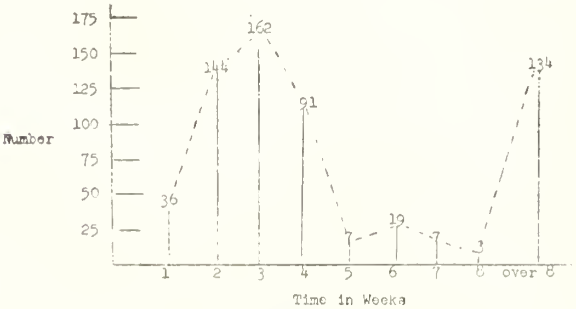

Fig. 2. Subarachnoid hemorrhage internal before recurrence.

In an attempt to prevent the late complications due to progressive thrombosis in the carotid, patients have been heparinized and then given dicumarol. Whether this has been of appreciable value has not been determined definitely because of the small number of cases and the relative infrequence of this complication. The frequency of vascular thrombosis seems somewhat to be related to damage of the intima (Dandy[4]) at the time of ligation. It is a good policy to wrap the carotid artery in fascia at the time of ligation so that when the ligature is drawn tightly, the damage to the intima is minimized. Another advantage in this method is the more easy removal of the suture in case of a complication. In one patient in the University of Minnesota series who developed late sequelae, the ligature around the carotid was removed. No definite improvement could be noticed except that the neurologic deficit did not increase thereafter.

The practice of partially occluding the carotid artery at the first operation, then reoperating upon the patient at a later date and completely occluding it has certain theoretical advantages. It should prevent or diminish the frequency of immediate complications from ischemia but contrarily it theoretically increases the possibility of producing an arterial thrombosis with its late onset of complications. Dandy was convinced that an adequate collateral circulation could be established by partially occluding the internal carotid artery (reducing the lumen about one-half) and then in seven to ten days accomplishing a total occlusion. It is very probable that if a patient has a normally developed circle of Willis the collateral circulation is consistently adequate. However, Dandy[4] found a high frequency of anomalous vascular formations in this region and concluded that cerebral ischemia was often due to inadequate collateral circulation through an inadequately developed anastomosing (communicating) artery. The practice of occluding the carotid in steps may permit the development of an adequate blood flow.

The location of the aneurysm determines the surgical procedure to be instituted. Aneurysms may be treated by (1) ligating the neck of the sac, (2) trapping the aneurysm between two clips, (3) trapping the aneurysm between a ligature in the neck and an intracranial clip. There have been other procedures advocated such as packing with muscle the immediate vicinity of the aneurysm so that the hemorrhage may not recur, opening the aneurysm and inserting a piece of muscle, cauterizing the aneurysm, and surgically excising the aneurysm with a plastic repair of the entering artery. None of the latter methods have found even temporary favor because either they have failed to prevent secondary rupture of the vessel or have been technically inadvisable. The policy we have followed has been to attempt ligation of the neck of the aneurysm. If this is not possible, the aneurysm is trapped between a clip distally and a carotid artery ligature proximally.

In the University of Minnesota series there have been four patients with aneurysms involving the infraclinoidal portion of the internal carotid artery. These have been treated by ligation of the internal carotid or of the external and common carotid artery in the neck and then performing a craniotomy with placement of a silver clip distal to the aneurysm. The latter clip, of course, is to prevent reflux of blood into the aneurysm from either the anterior or posterior communicating arteries. The one exception to the above treatment was the case of a 65-year-old woman in whom only a carotid ligation was performed. It was anticipated performing the second procedure of intracranial ligation but when she was relieved of her symptoms, she declined the operation. She has been followed for over two years and has remained symptom free.

One of the complications that might ensue following this method of ligating the carotid artery intra and extracranially is that this also traps the ophthalmic artery. Compromise of the blood flow through this vessel may result in loss of vision. This is infrequent, however, because sufficient collateral circulation is maintained through the external carotid system. It did not occur in this series. There was one patient who died as a result of compression and thrombosis of an aneurysm on the infraclinoidal portion of the artery. At the time of surgery the lesion was not recognized as an aneurysm but rather was thought to be a meningioma. A large piece of the aneurysm was excised and during the closure of this rent, the patient expired, presumably due to compromising the flow through the carotid artery.

There were seven patients with aneurysms located at the junction of the internal carotid and posterior communicating artery or between this site and the junction of the internal carotid with the anterior communicating artery. The importance of these two vessels, of course, is the part they play in the collateral circulation. Three of the aneurysms in this location have been treated by ligation of the neck of the aneurysm. In four patients it was impossible to ligate the neck of the aneurysm because of its width. In those cases the carotid artery was ligated in the neck and the carotid artery ligated intracranially distal to the aneurysm. An attempt was always made to maintain collateral circulation through the anterior communicating artery to the ipsilateral middle cerebral artery. A case representing such a problem occurred in this series. The aneurysm was at the junction of the internal carotid and the posterior communicating artery. The internal carotid was ligated in the neck and also intracranially. A postoperative angiogram revealed the maintained blood flow through the anterior communicating into the middle cerebral artery (Figs. 3 and 4).

There were nine patients treated for aneurysms located peripherally to the anterior communicating artery, i. e., out on either the anterior or middle cerebral artery. Ligation of one anterior cerebral artery can be done without apparent neurological deficit providing the systemic blood pressure is maintained, but ligation of the middle cerebral is likely to be followed by death or at least by a paresis or paralysis of the contralateral face and arm, and occasionally of the leg. When the aneurysm is located in the dominant hemisphere, there is considerable question of whether surgical attack should be proposed because of the probability of development of an aphasia. Aneurysms in this location are extremely hazardous to treat. According to Dandy there probably is less likelihood of curing a middle cerebral artery aneurysm (Figs. 6 and 7) at least without extreme neurologic deficit, then in the case of any other aneurysm of the brain. It seems that he was not including those aneurysms located in the basilar artery but his statement reflects the results expected in the treatment of middle cerebral artery aneurysms.

There has been only one aneurysm of the posterior cerebral artery in this series and that was in a 16-month-old child. In this patient the aneurysm was located about in the midline just above the pineal gland. It received its blood supply from branches from both the right and left posterior cerebral artery. Following intracranial clipping of these vessels the patient's general condition improved. A follow-up x-ray revealed the clip on one side had slipped off but an angiogram subsequently performed on that side failed to fill the aneurysm. It was concluded that the vessel had been thrombosed. Even so it is contemplated to re-clip the vessel at a later date.

There was one patient in this series with an aneurysm on the ophthalmic artery. It was treated with ligation of the vessel and the patient made an uneventful recovery.

There were no patients in this series treated for aneurysms located on the vertebral-basilar arterial system. The apparent infrequence of aneurysms in this location is due to (1) the difficulty in clinically recognizing such a lesion, and (2) the difficulty in demonstrating angiographically the exact location of the lesion due to inexperience with vertebral angiography. Both difficulties should in the future be resolved. Dandy stated in 1948

TABLE III

Intracranial Vascular Abnormalities Treated Surgically

Location Aneurysm	Number of Cases	Died	Mortality (Pct.)	Complications		
				Convulsion	Hemiparesis	III N.
Internal Carotid						
Infraclinoidal	4	1	14	–	–	—
Supraclinoidal	7	–	—	1	1	—
Ant. Cerebral	4	–	—	–	–	—
Middle Cerebral	4	–	—	–	1	—
Ophthalmic	1	–	—	–	–	—
Posterior Cerebral	1	–	—	–	–	—
Total	21	1	4.9	1	2	—

that he knew of no successful outcome from operative attacks upon an aneurysm located in the posterior fossa but he held out hopes that those located on accessible and relatively non-vital vessels such as the posterior-inferior cerebellar or one of the vertebrals may, in the future, be successfully attacked.

The results in the series of aneurysms treated surgically at the University of Minnesota Hospitals are shown in Table III. The operative mortality rate of 4.9 per cent is not too significant because of the smallness of the series. Dandy in a series of 105 aneurysms experienced a 25 per cent mortality rate. When one considers the prognosis of these patients if left untreated, it becomes immediately apparent that an attempt to cure them is justified.

SUMMARY

1. The causative agent in the majority of patients with subarachnoid hemorrhages is an arterial aneurysm.

2. The eventual mortality rate for the primary and recurrent hemorrhages is approximately 80 per cent if no attempt is made to eradicate the aneurysm.

3. An attempt should be made to locate and surgically eradicate the aneurysm as soon after the hemorrhage as the patient's general condition will permit a craniotomy. To procrastinate beyond the second week after the hemorrhage invites disaster because of the greater frequency of recurrent hemorrhage at that time.

4. Relatively poor general condition of a patient is no contraindication for angiography.

5. Intracranial aneurysms can be treated surgically with considerable success.

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A new and unique method of demonstrating surgical technics was introduced at the Clinical Congress of the American College of Surgeons, held in Boston in October—the "Cine Clinic on Boston Surgery," a technic combining the medium of color photography with actual discussion of the operations by leading surgeons. Showings retained all important features of the surgical clinic, but, in addition, showed the operations in sharply focused close-ups, eliminated extraneous detail and permitted the operating surgeon to explain his technic to a thousand rather than a dozen or so.

Some Aspects of the Pathologic Physiology of Lung Edema

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Minneapolis, Minnesota

PULMONARY edema occurs in a variety of clinical conditions and has been experimentally produced by a number of methods. Among the many pathologic conditions with which pulmonary edema may be associated are: heart failure, pneumonia, pulmonary infarction,[1] thoracentesis,[1,2] head injury,[3,4,5] central nervous system lesions,[6,7,8] insulin-produced hypoglycemic shock,[9] administration of eserine,[10] anaphylactic shock,[11] and exposure to toxic gases.[12-14]

EXPERIMENTAL PRODUCTION OF PULMONARY EDEMA

Some of the experimental procedures which are reported to produce pulmonary edema are: ligation of the pulmonary veins or thoracic aorta in rabbits,[15,16] artificial mitral stenosis,[17] bilateral cervical vagotomy,[18,19] respiratory air-flow resistance,[20-24] excessive positive intrapulmonary pressure,[25] intravenous or intratracheal administration of epinephrine,[17,26-29] intravenous administration of muscarine,[30,32] Lugol's iodine,[17,31] or methyl salicylate,[32] intratracheal instillation of normal saline,[33] repeated injections of tissue extracts, sodium glycocholate, histamine, or barbiturates,[34] injections of thiourea into rats[35] or ANTU (alpha-naphthyl thiourea) into rats or dogs,[36] exposure to phosgene, nitric oxide, ammonia, or carbon monoxide,[12,13,17,26,32,37] infusion of large volumes of fluid into the distal end of the carotid arteries,[38] infusion of plasma following cerebral lobectomy,[39] and hyperthermia.[40]

PATHOGENESIS OF LUNG EDEMA

Pulmonary edema is the result of net outward movement of fluid across the pulmonary capillaries. It may be interstitial or intra-alveolar. On general principles it may be predicted that this abnormal movement of fluid may depend upon multiple factors, such as effective pulmonary capillary pressure, effective plasma colloid osmotic pressure, the physico-chemical and physical state of the capillary wall, the adequacy of lymphatic drainage, and perhaps others. It also seems logical that each of these factors plays a role of varying importance in relation to the others. Although most investigators of the problem agree that these factors include the probable ones operating in the production of pulmonary edema, they tend to disagree upon their relative importance.

Wiggers[41] lists alterations in capillary permeability, changes in the composition of the blood, and increased intracapillary pressure, in order of importance, as being the determining factors in the production of pulmonary edema. Even in cardiac decompensation he discounts mechanical factors and states, "In cardiac failure deficient blood supply through the bronchial vessels may conceivably lead to formation of capillo-dilator products or may alter permeability through interference with normal vasomotor functions." In regard to lowered plasma proteins and colloid osmotic pressure he states, "It also remains doubtful whether decrease in plasma proteins *per se* can produce pronounced edema unless capillary pressure is simultaneously increased." He is more emphatic in his views on capillary pressure changes, stating, "There is little reason to believe that . . . . the capillary pressure can ever be increased sufficiently in the body to cause, by itself, the onset of acute edema."

Drinker[42,43] reports that dogs breathing a mixture of ten per cent carbon dioxide, 90 per cent oxygen against an inspiratory air flow resistance which created a negative intrathoracic pressure of 9.4 cm. water showed no pulmonary edema, only some dependent congestion, after four hours. When, instead, a ten per cent oxygen, 90 per cent nitrogen mixture was used, the oxygen content of the arterial blood being measured as 11.3 vol. per cent, "marked dependent congestion" was found after 2½ hours. He believes on the basis of this evidence in three dogs that anoxia is the most important factor in the production of pulmonary edema and advocates oxygen inhalation as the chief preventive and therapeutic procedure against it. Contradictory evidence has been presented by Haddy[44] who has reported changes in the lungs occurring in dogs subjected to an inspiratory or expiratory air flow resistance of 15 to 20 cm. water. Pulmonary arterial and venous pressures and arterial oxygen saturation were measured. He found that in those animals with minimal pulmonary edema there was no significant rise in pulmonary venous pressure except in the terminal moments, but in 17 animals with definite pulmonary edema there was a gradual sustained rise of integrated mean pulmonary venous and arterial pressures. Whereas the pulmonary venous pressure in the animals with minimal edema reached an average level of 8.6 mm. Hg, it reached an average level of 21.1 mm. Hg in animals with definite pulmonary edema, and the arterial oxygen content did not fall at any time. He concludes, "There was no correlation whatsoever between the arterial oxygen saturation and the amount of edema found at necropsy whereas there was a good correlation between edema and pulmonary venous pressure rise."

NEUROGENIC THEORY

There are numerous reports in the literature of acute pulmonary edema associated with head injury[3-5] and central nervous system lesions.[6-8] Many of these authors have attributed the edema to some neurogenic mechanism which changes the permeability of the pulmonary capillaries. The neurogenic theory has been further promoted by Farber[18,19] who reported that bilateral cervical vagotomy in rabbits leads to death in eight to 24 hours with severe acute pulmonary edema and congestion. He also reported that vagotomized guinea pigs given positive pressure artificial respiration succumbed to acute pulmonary edema within three and one-half to four hours while animals with intact vagi showed only congestion after five hours. The degree of positive pressure employed was not given. These findings were interpreted to mean that "disturbances to the vasomotor control of the pulmonary vessels . . . . lead to the production of severe pulmonary edema and hemorrhage." Lorber[20,21] carried out bilateral cervical vagotomy with and without tracheotomy in rats and guinea pigs and came to the conclusion that "pulmonary edema following bilateral vagotomy probably results primarily from respiratory obstruction" and can be prevented by maintaining a patent airway. Short[45] came to the same conclusion following similar observations in the rabbit. Farber's work has been further contradicted by Sussman, Hemingway, and Visscher[25] who observed that positive pressure artificial respiration did not produce pulmonary edema when the pressure did not exceed six mm. Hg either in the intact or vagotomized guinea pig. At 20 mm. Hg pressure, however, massive pulmonary edema appeared within five hours in both intact and vagotomized animals. Zinberg, Nudell, Kubicek, and Visscher[24] observed that in dogs subjected to respiratory air flow resistance bilateral cervical vagotomy did not increase the severity of the pulmonary edema. Campbell and Visscher[46] have reported that in the guinea pig under artificial respiration bilateral cervical vagotomy provided marked protection against the pulmonary edema produced by elevation of intracranial pressure. Pulmonary edema in dogs that results from elevation of intracranial pressure has been shown to be directly related to rise in pulmonary venous pressure.[47]

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STARLING-LANDIS THEORY

The effects of variations in capillary pressure, plasma colloid osmotic pressure, and capillary permeability in the prevention and production of edema in extrapulmonary sites have been rather thoroughly investigated. (The capillary hydrostatic pressure is opposed by the tissue pressure, and the colloid osmotic pressure of the capillary contents is opposed by the colloid osmotic pressures of the extravascular space contents. In the following discussion, therefore, only *net* hydrostatic and colloid osmotic pressures will be referred to). In 1861 Graham first suggested that the plasma colloids may exert an osmotic pressure.[48] In 1896 Starling,[49] using a peritoneal membrane in his osmometer, first measured the osmotic pressure exerted by the plasma proteins and found a value of about 25 mm. Hg. Although this is a small figure compared to the total osmotic pressure of the blood, about 5000 mm. Hg, contributed to largely by the crystalloids of the plasma, it is the colloid osmotic pressure which may influence the amount and direction of fluid movements across the capillary wall; for the crystalloids distribute themselves freely across the capillary wall, which is normally permeable to crystalloids and practically impermeable to colloids. This theory was formulated by Starling who stated, "Although the osmotic pressure of the proteids of the plasma is so insignificant, it is of an order of magnitude comparable to that of the capillary pressures; and whereas capillary pressure determines transudation, the osmotic pressure of the proteids of the serum determines absorption."

The plausibility of this theory was demonstrated in 1926 by Landis[50] who made successful, accurate, direct measurements of capillary pressures in the frog mesentery. He later measured capillary pressures in the web and muscle of the frog, in the mesentery of the rat and guinea pig, and in the skin of the human. He also measured the plasma colloid osmotic pressure for each species; and in every instance, although the absolute values varied with the species, the arteriolar capillary pressure was significantly higher than the venous capillary pressure, with the colloid osmotic pressure being intermediate. He re-stated Starling's hypothesis saying, "It is physically possible, therefore, that on the average, fluid is filtered from blood during its passage through the arteriolar portion of the capillary network while absorption takes place in the venous portion of the capillary network. Though this represents an average condition, fluid movement in individual capillaries will diverge from the average in accordance with variations in capillary pressure, diameter and flow."[51]

EFFECTS OF INCREASED CAPILLARY PRESSURE

The effect of variation in capillary hydrostatic pressure upon fluid movement in the frog mesentery was also studied by Landis using his micro-injection technique.[52] He found that when the hydrostatic pressure was less than nine cm. water, fluid moved from the extravascular spaces into the capillaries; and when the hydrostatic pressure was greater than 12.5 cm. water, fluid moved in the opposite direction. There was no net movement of fluid when the hydrostatic pressure was 11.5 cm. water. The rate of filtration was found to bear a linear relation to the difference between the capillary pressure and 11.5 cm. water, which is the value for the colloid osmotic pressure of frog plasma previously reported by White.[53]

The relation between abnormally high venous (and capillary) pressure and the appearance of edema in the perfused limb of a dog was reported by Bornstein and Budelmann[54] who found that when the venous pressure was raised to ten mm. Hg, edema appeared within one hour, whereas at lower venous pressures no edema appeared. Landis and Gibbon,[55] using a pressure plethysmograph on human subjects, found that after the venous pressure in the forearm reached a critical level of 12 cm. water, the rate of transudation from the vascular system into the extravascular spaces was directly proportional to the venous pressure. When the venous pressure was raised to extremely high levels (about 80 mm. Hg), it was found that not only did transudation increase, but a considerable amount of plasma proteins also passed through the capillary walls.[56]

Although the effect of increased capillary pressure in the pulmonary system has not been studied as extensively as it has in extrapulmonary sites, some experimental work on the problem has been reported. In 1878 Welch[15] produced acute pulmonary edema in rabbits by ligation of either the thoracic aorta or the pulmonary veins or by manual compression of the left ventricle. He ascribed the edema as resulting from "a disproportion between the working power of the left ventricle and the right ventricle" so that the right ventricle ejected more blood than the left. Unquestionably the pulmonary capillary pressure is raised by such procedures. In 1893 Löwit[16] confirmed these findings in rabbits. However, Antoniazzi, repeating Welch's experiments on rabbits could obtain pulmonary edema only occasionally. In dogs Sahli could not obtain these results and Kotowschtschikow could obtain them infrequently.[57] These negative results, however, prove only that it is possible to obstruct the aorta without obtaining a pulmonary venous pressure rise of sufficient duration and magnitude to produce lung edema. They do not prove that Welch was fundamentally in error in his interpretations. That the development of acute pulmonary edema is associated with high venous (and capillary) pressures has been shown by Campbell, Haddy, Adams and Visscher.[47] They found that the extent of pulmonary edema associated with increased intracranial pressure in dogs was significantly correlated with the magnitude of the increase in pulmonary venous pressure. Elevated pulmonary venous pressure, in turn, was found to be a consequence of bradycardia and lowered cardiac output and could be reversed by the administration of atropine.

EFFECTS OF DECREASE IN PLASMA COLLOID OSMOTIC PRESSURE

The general role played by the plasma proteins (and the colloid osmotic pressure which they exert) upon movement of fluid between the capillaries and their surroundings has also been noted both clinically and experimentally. The first incrimination of low plasma colloid osmotic pressure in the production of generalized edema in humans was made in 1922 by Hagedorn *et al,*[58] in a patient with severe albuminuria. In 1923 Barry[59] noted that pulmonary edema appeared rapidly in isolated dog heart-lung preparations perfused with blood which had been diluted with Ringer's solution. The degree of edema diminished following the addition of acacia to the perfusing blood, and he suggested, therefore, the use of intravenous injections of acacia to raise the plasma colloid osmotic pressure in patients with pulmonary edema.

In 1927 Drinker, working in Krogh's laboratory, found that the addition of relatively large quantities of horse serum to the perfusing fluid prevented the appearance of subcutaneous edema in the perfused frog leg. He attributed the favorable effect of the serum to its maintaining the capillaries in normal condition and not to the increased colloid osmotic pressure.[60] In dogs experimental edema has been produced by plasmaphoresis[61-63] and prevented by reinjection of the washed red blood cells in a solution of acacia, demonstrating that the plasma colloid osmotic pressure and not the plasma proteins *per se* influences the movement of fluid across the capillary wall.[64]

The clinical literature contains reports of cases of generalized edema associated with measured low plasma colloid osmotic pressure resulting from loss of proteins in the urine,[65,66] and there are also reports of amelioration of edema by the intravenous injection of plasma or plasma substitutes.[67,68] The first report of successful treatment of patients with pulmonary edema by the intravenous injection of triple strength plasma appeared in 1946.[69]

RELATION BETWEEN CHANGES IN HYDROSTATIC AND COLLOID OSMOTIC PRESSURES

The relationship between changes of the same magnitude in venous pressure and colloid osmotic pressure was studied in humans by Krogh, Landis and Turner.[70] Using the pressure plethysmograph to record changes in extravascular volume of the forearm, they observed that a rise in venous pressure increased the extravascular volume by an average of .0023–.0033 cc./min./100 cc. forearm/one cm. water rise whereas a rise in plasma colloid osmotic pressure decreased the extravascular volume by an average of .0027–.0045 cc./min./100 cc. forearm/one cm. water rise. It was thus demonstrated that changes in the hydrostatic or colloid osmotic pressure produced practically the same magnitude of effect, in the opposite direction, upon the movement of fluid across the capillary wall.

Pappenheimer and Soto-Rivera[71] perfused isolated hind limbs of dogs and cats with homologous serum solutions, recording the limb weight continuously. A rise in arterial or venous pressure produced edema and an increase in weight, while lowering of the arterial or venous pressure resulted in a decrease in weight, changes in venous pressure being one-fifth to one-tenth as great as changes in arterial pressure required to produce the same effect. By simultaneous lowering of arterial pressure and raising of venous pressure an "isogravimetric" state was obtained with no net change in weight of the limb. Raising or lowering of the colloid osmotic pressure resulted in changes fairly consistent with the Starling-Landis theory. Zinberg and Visscher[72] perfused isolated, ventilated rat lungs through cannulas tied in the pulmonary trunk and left atrium. The hydrostatic pressure and the composition of the perfusing fluid were varied while other conditions, as far as possible, were kept constant. It was found that, under the conditions of these experiments, pulmonary edema occurred whenever the hydrostatic pressure was increased and/or the colloid osmotic pressure was decreased, in accordance with the Starling-Landis theory.

EFFECTS OF DAMAGE TO CAPILLARY WALL

According to the Starling-Landis theory the balance between the effective capillary hydrostatic and effective colloid osmotic pressures prevents the occurrence of edema. It is, therefore, obvious that any agent which damages the capillary wall, making it abnormally permeable to the plasma proteins, will upset this balance of forces and produce edema. This was demonstrated in the perfused frog's leg by Freund[73] who observed that the capillaries became permeable to albumin following the injection of arsenic. There are numerous similar observations in the literature.[55,74] Pulmonary edema resulting from phosgene poisoning or ingestion of ANTU is probably due to the toxic effects of these agents upon the pulmonary capillaries, increasing their permeability to protein. This was demonstrated by Cameron and Courtice[12] who found that in rabbits developing pulmonary edema following exposure to phosgene gas the protein concentration of the edema fluid was the same as the plasma protein concentration and that the total plasma protein loss could be accounted for by the total protein content of the edema fluid. Latta[36] found the same relationship existing between the protein content of pleural effusion fluid and plasma in rats developing pulmonary edema and pleural effusion following ingestion of ANTU.

ROLE OF CAPILLARY "PORES" AND PARTICULATE MATTER

In 1867 Cohnheim[75] observed in the frog's web that severe venous congestion produced capillary dilatation followed by extravasation of red blood cells. When the congestion was relieved, normal blood flow ensued with no evidence of capillary damage. These observations led him to postulate that under pressure the red blood cells escaped through preformed stomata which closed when the pressure was reduced. A similar observation was made by Landis[51] who introduced India ink under a pressure of 50 to 60 mm. Hg into a single capillary of the frog's mesentery and found that some of it escaped, collecting outside the vessel wall. When the injection was stopped and blood allowed to flow normally through the capillary, there was no evidence of capillary leakage. The role of particulate matter in blocking these capillary "pores" and preventing edema has been noted by Danielli[76] who found that the rapid appearance of edema in the lower half of frogs during perfusion with Ringer's fluid could be protected against by the addition of acacia, ox serum, ovalbumin or sheep hemoglobin to the perfusing fluid. The most effective agent was found to be horse platelets, a suspension of platelets in acacia being just as effective as an ox serum solution 1000 times more concentrated in protein. He hypothesized that the platelets act mechanically by blocking the "protein-permeable pores" in the arterial portion of the capillary, thus preventing transudation. Zinberg and Visscher[72] observed that particulate matter, in the form of India ink or heterologous red blood cells, in the perfusing fluid or on the walls of the pulmonary capillaries partially protected against the appearance of edema in the isolated, perfused rat lung.

CONCLUSIONS

Pulmonary edema has been produced experimentally by many apparently different procedures. The experimental evidence indicates that there are fundamentally only two important ultimate mechanisms: (1) an increase in pulmonary capillary pressure above the plasma colloid osmotic pressure, and (2) an increase in pulmonary capillary permeability to protein. The first mechanism is the one of greater importance in experimental pulmonary edema and probably in most clinical lung edema, excepting that produced by poisons and that associated with inflammation.

There is no substantial evidence that neurogenic factors acting directly upon the lung vessels cause pulmonary edema. It is more likely that nervous factors mediate pulmonary edema indirectly through effects upon the heart.

The permeability of lung capillaries to colloid and water is increased by poisons. It is also crucially influenced by particulate matter in the fluid perfusing the lung. The role of particulate matter, especially the blood platelets, in controlling pulmonary edema in the intact animal has not been investigated.

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Chronic Pyelonephritis and Hypertension*

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Chronic pyelonephritis refers to lesions in which both renal parenchyma and pelvis are involved. In the absence of hydronephrosis it is of hematogenous origin and many of the hydronephrotic cases may be of hematogenous origin. Ten per cent of cases occur without hydronephrosis and 90 per cent have hydronephrosis and may be either unilateral or bilateral. Obstruction, therefore, plays an important role. If the obstruction is in the ureter 30 per cent of cases are infected, but if the obstruction is in the bladder or urethra 60 per cent are infected.

Macroscopic examination of the kidney surface shows deep coarse pits produced by areas of cortical atrophy, and the mucosa of the renal pelvis is roughened and granular. Microscopic examination, particularly in the contracted kidney, or sections through cortical depressions, show dense foci of small lymphocytes and almost complete disappearance of tubules while the glomeruli are hyaline or absent.[1]

Atrophy of pyelonephritis may be circumscribed as to resemble infarct or so diffuse as to resemble primary atrophy. It follows chronic pyelonephritis or healing of a cortical abscess and is usually unilateral. An atrophic pyelonephritis, whether on one or both sides, is a further stage of inflammatory destruction. Kidneys with such conditions are imbedded in thickened and adherent capsules and perirenal tissue, and are usually reduced to one-fourth normal size.[2]

Chronic unilateral pyelonephritis is associated with hypertension in a few cases. Dr. Bell states that few reports in literature in which a severe hypertension has been permanently relieved by removal of an infected kidney. He states further that if the kidney is functionless there is no harm to the patient in its removal. In fact, inasmuch as it may become hydronephrotic and infected, and since there is a good chance of reducing blood pressure permanently, it is a sound procedure to remove the functionless kidney, providing, of course, that the other kidney is normal and has good function.[3]

Braasch and Jacobson found hypertension in 47 per cent of cases of chronic unilateral pyelonephritis. In a large proportion of the cases permanent reduction of blood pressure followed nephrectomy. As a clinical entity atrophic pyelonephritis is not often observed. The lesion is the result of extensive renal infection and is characterized by widespread atrophy of renal tissue. Surgical treatment is indicated only when unilateral complications develop, such as increase of infection, pelvic stasis, lithiasis or other lesions which causes unilateral intrarenal vascular imbalance. Hypertension associated with atrophic pyelonephritis will be relieved by surgery in 70 per cent of cases.[4,13,14]

Braasch and Jacobson report also a study of 180 cases in which definite findings of chronic bilateral pyelonephritis were made with hypertension in only 26 per cent. In a control group of 975 cases taken at random at Mayo Clinic, there was an incidence of hypertension of 20 per cent. Thus in the known cases of pyelonephritis there were only six per cent more cases of hypertension as compared with a group of cases chosen at random.[5,11,12]

Houston adds five cases to recently accumulated literature in evidence that unilateral renal disease may be a cause in some cases of hypertension and that nephrectomy or repair of kidney may bring blood pressure to normal. He also notes that an absence of hypertension in many cases of unilateral renal disease, and that nephrectomy failed to reduce blood pressure and hypertension returned in many cases after lapse of time. He further warns against too great an optimism in considering nephrectomy as a panacea for all such cases.[6]

Kimmel reports that hypertension has long been known to occur in certain cases of glomerulonephritis and cases of urinary obstruction. Only more recently, in 1942, was hypertension reported in association with pyelonephritis. In experiements on dogs and monkeys, obstruction of blood flow to kidney caused hypertension.

In a study of 510 infants and children, Kimmel found 91 cases with renal disease. Unilateral chronic pyelonephritis was found in 68, and only six had hypertension. The other 23 patients had bilateral pyelonephritis and of these only four had hypertension. Kimmel states that there is no correlation between renal function as evidenced by level of urea in blood and hypertension in this series.[7,17]

Barker and Walters reported in 1938 a case of hypertension in a man aged 42. When his unilateral chronic atrophic pyelonephritis was treated by nephrectomy, a blood pressure of 200/140 returned to normal and follow-up for two years revealed pressure to be 130/90. In 1940 these authors reported four more cases of nephrectomy for chronic atrophic pyelonephritis with return of blood pressure to normal and remaining normal. They state that this offers ample evidence that diseased kidney was the chief factor in production of hypertension.

These writers report further a study of 100 patients with hypertension and only four were found to have chronic atrophic pyelonephritis. Among advanced cases of chronic atrophic pyelonephritis the incidence of hypertension was fairly common. Barker and Walters believe that surgical removal of diseased kidney is indicated as treatment of the hypertension when unilateral atrophic pyelonephritis is found and other kidney functions normally.[8,15,16]

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*Presented at the staff meeting of Our Lady of Mercy Hospital, Alexandria, Minnesota, January 18, 1950.

In 1941 Nesbit stated that most cases of unilateral chronic pyelonephritis with hypertension subjected to nephrectomy were cured or improvement of hypertension occurred. Failure may be due to extra renal causes or vascular lesion of surviving kidney.[9]

Butler reports 15 patients with chronic pyelonephritis and hypertension over a period of years. The blood pressure returned to normal after nephrectomy in two of the patients.

Following is the report of a case of chronic unilateral pyelonephritis with hypertension treated with nephrectomy.

CASE REPORT

Mrs. W. H., aged 46, was first seen in 1944 for a minor pelvic disturbance. She was seen again in September, 1948, at which time she complained of a large mass in her abdomen. Examination revealed a large tumor extending from pelvis which was diagnosed as a probable fibroid of the uterus. Blood pressure was normal both in 1944 and 1948.

At the operation September 16, 1948, it was found that the large mass was that of a large, soft fibroid with massive attachments through inflammatory processes to the pelvic walls, rectum and small bowels. The tumor was identified and freed with greatest difficulty, profuse bleeding encountered, and the left ureter was fused in the adhesion and because of difficulty of identification and profuse bleeding, difficulty of exposure, damage was inflicted on the left ureter. This fact was recognized as very probable when the removed tumor was examined after operation. Fortunately the patient made an uneventful recovery and was able to leave the hospital on the seventeenth postoperative day.

Repeated examinations after the operation while at the hospital revealed a steadily rising blood pressure and then finally after return home the blood pressure was up to 230/130. Notwithstanding this marked hypertension the patient was remarkably free from symptoms. She was aware of the presence of hypertension because of the rushing of the blood in her head.

Her blood pressure on January 29, 1949, was 230-240/130-130. Cystoscopic examination revealed a normal bladder wall and trigone. It was impossible to pass the catheter up on the left side but possible to pass it readily on the right side. The urine from the right side was essentially negative and from that side the PSP administered appeared in four minutes and 35 per cent of dye was recovered in 30 minutes. The pyelogram showed a normal pelvis and calyces on the right kidney. An excretory urogram exhibited normal pelvis and ureter on the right side with no visualization on the left. A two hour PSP excretion was 65 per cent. The kidney ability to concentrate was excellent. Blood studies, electrocardiogram and chest plates were all normal. The conclusion was that there was a normal functioning right kidney with a nonfunctioning kidney on the left.

On February 7, 1949, under pentothal and gas anesthesia, a left extraperitoneal lumbar nephrectomy was performed without incidence.

Following is the pathological report by Dr. E. T. Bell: "The kidney measures about 8 cm. in length and the cortex is only slightly reduced in thickness. This is some dilatation of the pelvis. Microscopic sections show an extensive lymphocytic infiltration in the medulla and the cortic medullary junction. This interpretation is a severe chronic pyelonephritis.

"This is the type of kidney that is supposed to cause hypertension. Did patient have hypertension?"

The patient recovered from the operation without any complications. During the convalescence at the hospital blood pressure readings showed a prompt fall and when she left the hospital in February, 1949, the blood pressure was 150/92.

During the past year the blood pressure has remained within normal limits, the systolic has been between 140 and 150 and the diastolic pressure between 90 and 100.

On examinations January 10 and 14, 1950, the blood pressure was 150/92. The patient has been feeling very well with no definite complaints. She has observed that when she overworks, such as doing heavy lifting, or when she does such work as chiseling holes in the ice, she notices some pain over the left back and forward into the pelvis. She has been walking as much as 15 miles a day without any ill effect. She has a tendency to gain weight and is slightly constipated. She has no complain referable to the pelvis or urinary canal, no nocturia or frequency, nor any spells of nervousness or headaches.

Examination reveals that she is in excellent physical condition. The urine is negative, hemoglobin 105 per cent, red blood cells 5,050,000, white blood cells 7,550, the differential is within normal limits and x-ray of chest and electrocardiogram likewise show no pathology.

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The Search for Therapeutically Useful Parasympathomimetic Compounds*

E. H. Sakal, Ph.D.†
New York City

The word "parasympathomimetic" was introduced about 40 years ago by Sir Henry Dale to designate those chemical substances which, when introduced into the animal organism, mimic the effect of stimulation of parasympathetic nerves.

AUTONOMIC NERVOUS SYSTEM

The autonomic nervous system (Figure 1), also known as the vegetative or involuntary nervous system, consists of nerves and ganglia which control the heart, blood vessels, glands, viscera and smooth muscles. From the anatomical viewpoint, the autonomic nervous system falls into two main divisions—the sympathetic nervous system and the parasympathetic nervous system.

The cells of origin of the sympathetic division lie in the spinal cord from the first thoracic to the fourth lumbar segments. These cells are connected with nerve cells in outlying ganglia, by means of preganglionic fibers. The nerve fibers arising from the ganglion cells are referred to as postganglionic. The parasympathetic fibers stem from three different levels of the central nervous system—the midbrain, the medulla and the sacral region of the spinal cord. In the parasympathetic nervous system the ganglia lie in close relation to the innervated organs.

As a result of the classical work of Loewi and of Cannon and their associates, it is now generally accepted that autonomic nerve impulses effect responses in muscles and glands essentially through the mediation of acetylcholine and an epinephrine-like substance termed sympathin, liberated at the nerve endings. Dale proposed the terms *cholinergic* and *adrenergic* as functionally descriptive terms for the purpose of specifying which of the two chemical substances is involved. A physiological classification into cholinergic nerves and adrenergic nerves has resulted: cholinergic nerves include all nerves which upon stimulation release acetylcholine at their terminal. At this site the enzyme cholinesterase is present and rapidly hydrolyzes the acetylcholine, thereby allowing the synapse to rest until the next stimulus arrives. The class of cholinergic nerves comprises all preganglionic autonomic nerves (whether sympathetic or parasympathetic), all postganglionic parasympathetic nerves, also the postganglionic sympathetic nerves leading to sweat glands and certain vascular beds of the lower limbs, as well as all motor nerves to skeletal muscles. Adrenergic nerves include all nerves which release sympathin at their endings. They consist exclusively of postganglionic sympathetic fibers. From a physiological point of view, the sympathetic and parasympathetic nervous systems generally stand as antagonists in their effects on the viscera; the level of activity at any one moment is the result of a balance between the two component actions.

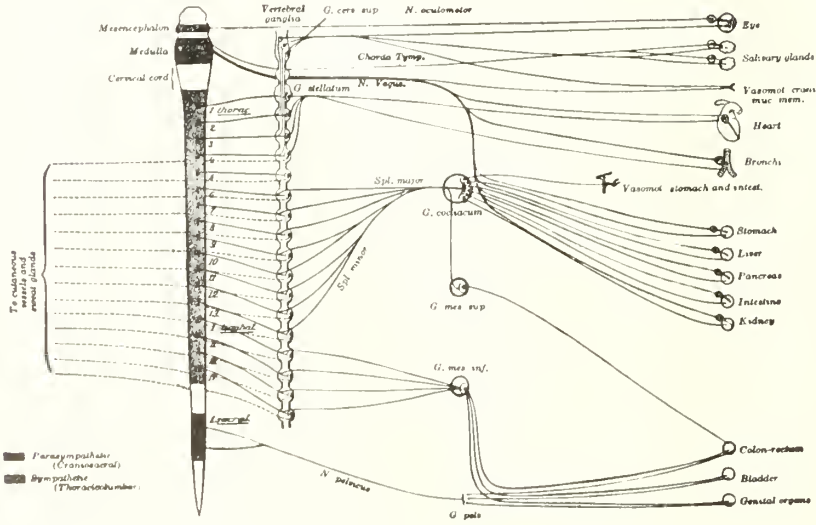

Fig. 1. Diagram of the autonomic nervous system (From Myer and Gottlieb's *Pharmacology*, reproduced by permission of the J. B. Lippincott Company).

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*Presented at the 116th meeting of the American Association for the Advancement of Science, New York City, December 30, 1949.

†Warner Institute for Therapeutic Research, New York City.

Autonomic Drugs

The classification of autonomic drugs represented in Table I is essentially that proposed by Goodman and Gilman.[1]. The group of substances bracketed in Table I may be said to constitute the parasympathomimetic drugs. These may now be defined as autonomic drugs stimulating structures innervated by cholinergic nerves—whether preganglionic or postganglionic.

Table I

Classification of Autonomic Drugs
(According as they simulate the stimulation or depression of cholinergic and adrenergic nerves)

	Cholinergic Nerves		Adrenergic
	Preganglionic	Postganglionic	Nerves
Stimulants	A. Ch. and other choline esters Physostigmine Neostigmine, Stigminene*	A. Ch. and other choline esters Physostigmine Neostigmine, Stigminene*	Epinephrine Other sympathomimetic amines
	Nicotine	Muscarine	
Depressants (Automatic blocking agents)	Nicotine	Atropine	Ergotamine
	Curare	Scopolamine	Dioxane derivs.
	A. Ch.		Other sympatholytic agents
	Physostigmine		

*This group potentiates the action of A. Ch. by inhibiting cholinesterase.

The parasympathomimetic action or cholinergic action as it is often referred to, may be further subdivided into the so-called *muscarinic* and *nicotinic* actions, according as to whether it resembles the effects of the alkaloid muscarine or that of the alkaloid nicotine, respectively. The muscarinic action is characterized by such effects on smooth muscles and glands as cardiac slowing, peripheral vasodilatation, hypotension, increased intestinal peristalsis, miosis, bronchial constriction, salivation, micturition and sweating. These responses are all inhibited by atropine. The nicotinic action may be described as the stimulant action of choline esters on autonomic ganglia. The criterion of this effect is a rise in blood pressure. This terminology is used because it has long been known that nicotine stimulates autonomic ganglia before paralyzing them. Indeed, large doses of acetylcholine may produce a depressant effect on ganglia and skeletal muscles similar to that of nicotine and curare.

Parasympathomimetic Compounds

The known parasympathomimetic compounds fall into three main categories: the choline esters and their derivatives, the older alkaloids, consisting essentially of pilocarpine, arecoline and muscarine; and the inhibitors of cholinesterase. The reversible inhibitors consist of physostigmine and its congeners, whereas the irreversible type involves the alkyl phosphates.

Choline esters. Among the esters of choline, acetylcholine is of greatest interest because of the unique role it plays in the neurophysiology of the animal organism. Pharmacologically, acetylcholine exhibits powerful cholinergic properties, by far stronger than those of its near homologues, formylcholine, propionylcholine, butyrylcholine and valerylcholine (Table II). The trend for higher homologues, as well as for the aromatic esters of choline, is towards a paralyzing nicotinic action. However, because of its instability and consequent transient action, acetylcholine is of limited clinical value.

The pharmacological effect of acetylation of the alcohols related to choline varies widely with the chemical structure involved.[7-12] With the acetylation of choline itself, there is a hundred thousand-fold potentiation of activity. With β-methylcholine the potentiation is even higher, and the resulting acetate is at least as potent as acetylcholine. Acetyl β-methylcholine has been marketed under the name Mecholyl, and has received appreciable clinical favor because of its somewhat higher stability than acetylcholine towards enzymic hydrolysis.

The carbamic ester of choline, carbaminoylcholine, which was found to possess strong cholinergic properties has been marketed under the trade name Doryl. It has received considerable clinical attention on account of its high stability and powerful parasympathomimetic properties;[14] its gastrointestinal effects precede cardiovascular responses. In the case of Mecholyl this sequence is reversed.

The older alkaloids. The second main group of parasympathomimetic compounds consists essentially of three alkaloids first investigated in the middle of the nine-

Table II

Choline Aliphatic Esters $\text{R COOCH}_2\text{CH}_2\overset{+}{\text{N}}\text{Me} \quad \overline{\text{OH}}$

Muscarinic Activity

	Hypotensive Activity		Peristaltic Effect		
	Cat[2]	Rabbit[3]	Dog[4]	Isolated Guinea Pig Intestine[5]	Isolated Rabbit Intestine[3]
Choline	1/100,000	1,20,000		1/1000	1/1300
Formylcholine			1/2	1/10	
Acetylcholine	1	1	1	1	1
Propionylcholine	1/20	1/25	1/180	1/3	1/33
Butyrylcholine	1/200	0		1/25	1/400
Valerylcholine				1/66	1/500

teenth century. These substances known as pilocarpine, arecoline and muscarine, have similar pharmacological properties. Pilocarpine occurs in the leaves of the South American shrubs, *Pilocarpus jaborandi* and *Pilocarpus microphylus*, while arecoline is obtained from the East Indian areca nut also known as the *betel nut*. Muscarine, the oldest known of these alkaloids, is the active ingredient of a species of poisonous mushrooms that goes by the name of *Amanita muscaria*. This species is common in North America.

The three alkaloids (Figure 2) have very similar effects, characterized by a direct action on smooth muscle and gland cells innervated by postganglionic cholinergic nerves.[15] As already pointed out, this action is so typical that in cholinergic drugs generally, it is described as *muscarinic*. However, pilocarpine, arecoline and muscarine have little or no nicotinic action. These alkaloids are rarely prescribed in modern therapy because of the severe discomforts of their side effects. The symptoms of overdosage are profuse salivation, lacrimation, sweating, vomiting, exaggerated activity of the bowel and urinary bladder, bronchial spasm and cardiovascular collapse. Atropine is a specific antidote for these effects.

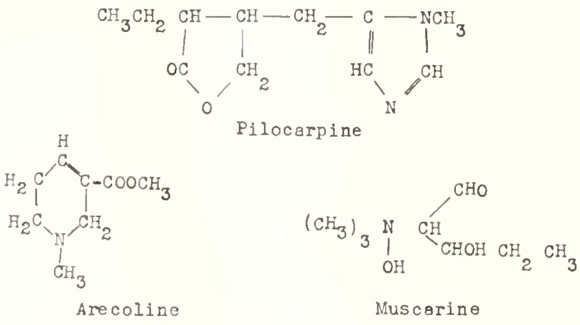

Fig. 2. The structural formulas of pilocarpine, arecoline, muscarine.

The third main category of parasympathomimetic derivatives consists of the inhibitors of the enzyme cholinesterase (Ch. E.). Immediately after an impulse is transmitted, the acetylcholine, which acts as mediator, is inactivated by the hydrolytic action of Ch. E. The presence of a drug which inhibits this enzyme action will prolong and intensify the responses of acetylcholine.

Reversible inhibitors of Ch. E. The oldest known inhibitor of Ch. E. is the alkaloid physostigmine which occurs in the calabar bean found in tropical West Africa. It has been reported that the native tribes regarded the beans with mystery and used them as an "ordeal poison" in the detection of crime. If the accused had a clear conscience, he would supposedly eat the beans rapidly, thereby suffering gastric irritation. This would make him vomit the powerful poison and he would be saved. But the guilty one, afraid of the trial, would eat slowly, retain the poison and die. Thus, in a single act, the witch doctors of tropical West Africa contrived the verdict, sentence and execution.

There seems to be little doubt that the pharmacological action of physostigmine (Figure 3) is due to its powerful anti-Ch. E. activity. The drug strongly inhibits the enzymic hydrolysis of acetylcholine and there results an intensification of cholinergic effect. Therapeutically, physostigmine has been used in the treatment of glaucoma where it relieves the intra-ocular pressure produced by the disease. The drug has also been used to induce voiding of the urinary bladder and evacuation of the bowel in cases where these organs have sustained surgical trauma.

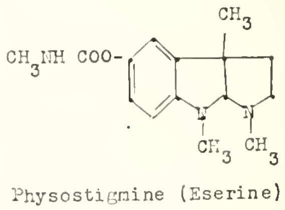

Fig. 3. The structural formula of physostigmine.

During the last fifteen years, neostigmine, a compound chemically related to physostigmine, has been widely used in the treatment of myasthenia gravis. Although the relief obtained with neostigmine is striking, it is purely symptomatic. In advanced cases the daily dose has to be progressively increased, and the time may come when the drug is no longer effective.

STUDIES OF A NEW SERIES OF ANTI-CHOLINESTERASE COMPOUNDS

In the pyridine series, about sixty compounds have been synthesized using, as the point of departure, the following generic structure (Figure 4). These compounds are quaternary salts of substituted carbamic esters of 3-hydroxypyridine.

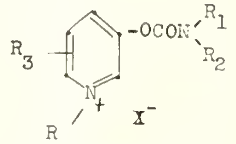

Fig. 4. The structural formula of the anticholinestase compounds.

This investigation* consists of a study of the effect on parasympathomimetic activity, of structure variations performed at three different centers: the ester side chain, the quaternizing radical and substitution in the pyridine nucleus.[21,23,24]

In variations on the urethan side chain the activity is highest when R_1 and R_2 are methyl groups. Sulfur analogues, such as the dimethylsulfamate and the dimethylcarbamylmercapto derivative, show a lower biological activity. The compounds in Table III represent variations in the quaternizing radicals. In the first four compounds R is an alkyl group and these derivatives are the most active in the dog experiments. The allyl derivative is about ten times less active and the alkyl compounds are between five and twenty times less active than the aralkyl derivatives. As the length of the alkyl chain is increased, the activity reaches a peak with the propyl and butyl derivatives.

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*This work, carried out at the Warner Institute for Therapeutic Research, was discussed in some detail in a paper[22] by Dr. H. M. Wuest and the author, presented before the Medicinal Section of the American Chemical Society's 115th meeting in San Francisco, California, March 27 to April 1, 1949.

TABLE III

Biological Activity and Quaternizing Radical (Fig. 5)

R	Anti Ch.E. Activity *in vitro*	Toxicity in Mice LD_{50} mg/kg I. V.	Contraction of Dog Intestine *in situ* mg./kg. I. V.
1. Benzyl (Stigminene)	1	0.25	0.1
2. 4-NO_2-benzyl	1	0.40	0.1
3. 2-Naphthylmethyl	1	—	0.1
4. 2-Phenylethyl	1	0.60	0.2
5. Allyl	1/4	4.0	1.0
6. Methyl	>1/7	1.7	1.0
7. Ethyl	>1/6	—	1.0
8. n-Propyl	1/7	4.5	0.5
9. n-Butyl	>1/6	—	0.5
10. n-Amyl	1/4	4.0	1.0
11. n-Hexyl	—	—	2.0
12. n-Heptyl	—	—	2.0 inactive

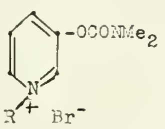

Fig. 5. The structural formula of the quarternizing radical.

The effects on biological activity of substitution in the pyridine nucleus are shown in Table IV. It may be observed that one, two or three methyl substituents in the positions indicated have little effect upon the activity, as determined by intestinal peristalsis promoted in the dog. On the other hand, iodine substitution in the 2-position of the pyridine ring raises the potency by a factor of forty.

TABLE IV

Biological Activity and Nuclear Substitution (Figure 6)

		Contraction of Dog Intestine *in situ* I. V.	
R	Anti Ch. E. Activity *in vitro*	mg./kg.	Relative Potency
1. 2-Iodo	>1	0.025	40
2. 2,6-Dimethyl	>1/4	0.5 to 1.0	1 to 2
3. H	>1/7	1.0	1
4. 2,4,6-Trimethyl	1/30	1.0	1
5. 6-Methyl	—	2.0	0.5

Following successful clinical trials of its cholinergic properties, the benzylquaternary salt listed uppermost in Table IV has recently been made available under the trade mark Stigminene Bromide. This substance is characterized by a high degree of selective action upon the gastrointestinal and urinary bladder musculature. Its freedom from deleterious effects makes the drug eminently suitable for the prevention and treatment of abdominal distension.[25]

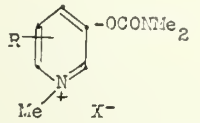

Fig. 6. The structural formula of the pyridine ring.

Irreversible inhibitors of Ch. E. During the recent war, a number of extremely toxic alkyl phosphates were synthesized. These substances, originally intended as chemical warfare agents and insecticides, were found to be potent inhibitors of Ch. E. They differ fundamentally from the aromatic urethans previously discussed in that, unlike the latter, the alkyl phosphates are irreversible inhibitors of Ch.E., that is to say, the enzyme inhibited by their action cannot be re-activated. The responses of autonomic structures to the action of the alkyl phosphates are similar to those obtained with physostigmine and its congeners but they are more prolonged.

The field of irreversible inhibitors of Ch. E. has attracted a large number of investigators and the outstanding compounds studied are di-isopropyl fluorophosphate (DFP), tetraethyl pyrophosphate (TEPP) and hexaethyl tetraphosphate (HETP), whose structures are shown in Figure 7.

The alkyl phosphates elicit marked muscarinic and nicotinic responses which can lead rapidly to death. The levels of cholinesterase in animals receiving a lethal dose of alkyl phosphate are too low for normal physiological function.[26,27,28] The main lethal effects are bronchial constriction and muscular paralysis leading to respiratory failure. A combination of atropine and magnesium ions has been found very effective in protecting animals from

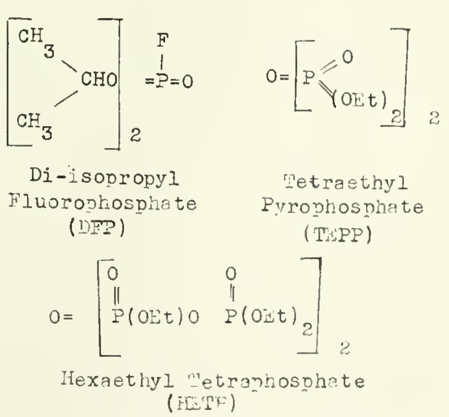
Di-isopropyl Fluorophosphate (DFP)
Tetraethyl Pyrophosphate (TEPP)
Hexaethyl Tetraphosphate (HETP)

Fig. 7. The structural formulas of di-isopropyl fluorophosphate, tetraethyl pyrophosphate, and hexaethyl tetraphosphate.

an otherwise lethal dose of the alkyl phosphate.[29,30] The alkyl phosphates have been used extensively in clinical trials; DFP has proved especially promising in the treatment of certain types of glaucoma[31] and also in abdominal distention. In myasthenia gravis TEPP appears to be somewhat more effective than neostigmine.[32,33]

For a while it appeared that the sustained action of the alkyl phosphates might lead to their adoption in cholinergic therapy in the place of the reversible inhibitors of Ch. E. But this prospect was followed by numerous disappointments. The chief disadvantage in the use of the alkyl phosphates is their rather narrow therapeutic dose range; consequently, toxic side reactions are apt to occur. However, as the work in this field continues, it is probable that irreversible inhibitors of Ch. E. with improved therapeutic utility will be forthcoming.

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Pathologic Nerve Section Bilateral Brachial Plexus Block, Traumatic

A Case Report

Daniel H. Bessesen, M.D.
Minneapolis, Minnesota

The patient, a woman of 50, had been involved in a car accident while traveling in Arizona. The car in which she was riding had gone over some shale and sank to the hubs, causing the front axle to buckle, and the car to turn over. The left rear window was forced from its window casing, and thrown over the face and thorax of the patient, who was a passenger in the left rear seat. Since the window was of the shatterproof type it had not broken but had molded itself over the contours of her upper body. The patient was removed by cutting open the rear of the car and transported by ambulance to a local hospital. When, a week later, she was removed across country by Pullman to Minneapolis, she could stand, but there was no movement in the shoulders, elbows, wrists or fingers. Sensation was also missing and the reflexes were minimal throughout the upper extremities. Some pain was present, though the pain was more marked later during the healing stages of the lesion.

Treatment was instituted immediately, using heat, therapeutic vitamins and minerals, diathermy, constant and Faradic currents, infra-red rays and massage to maintain muscle tone during healing.

After two months of effort, the right hand was first to show evidence of return of nerve function, indicating the greater intensity of the blow from the left side. During the next two to three months, the forearm and upperarm followed in return to use. Then the left hand began to show slight signs of function. The progress of the left forearm and upper arm was much slower than the right, taking a full three months for a weak restoration of muscle activity.

It is anticipated that one year and two years will go toward regaining the strength of the arms to more nearly normal. It was a full six months before the right arm could be raised above the head to the vertical position.

The blow in the lateral cervical regions caused traumatic interruption of the nerve functions of the brachial plexuses, bilateral. Wallerian or retrograde degeneration of nerve tissues is a certainty in anatomic nerve section, and can also occur in pathologic section, although not with the completeness of an incised wound. Pathologic section may be due to trauma, deficiency diseases, cold, or intoxications produced by infection or drugs. Whatever the cause, all factors of nerve healing must be brought to bear in any type of nerve injury. These therapeutic measures are listed above with the possible exception of the other various forms of heat and hydrotherapy. In all cases, the etiology should be removed if recognized.

In any case requiring lengthy treatment, the time element necessary for recovery must be explained and emphasized to the patient. The general tendency to seek counsel of many medical advisors—to drift from doctor to doctor—makes complete healing more difficult. The effort made to enable the patient to understand the pathology and its treatment, the methods of repair, how to care for himself, and how to live with his problem and to bear with the weakness and its crippling defect, is more essential in nerve lesions than any other type of difficulty.

Nerves are the most highly differentiated of all tissues, and nerve injuries of whatever variety demand more prolonged, patient, gentle care for complete return of function than does any other tissue damage. Contrariwise, neglect of such kindly, understanding methods, will surely lead to failures where failure should not occur.

In general, the patient should utilize every known means of healing, and not depend upon any one mode of therapeutics to the exclusion of all others. To impress upon the patient that each procedure, manipulation and medication carries its part in recovery is the responsibility of all doctors, nurses and attendants concerned.

PLANT HUNT TO AID CORTISONE

Four experts from the Department of Agriculture will scour the southwestern United States and northern Mexico this coming year in search of plants whose seeds may contain a chemical that may build up the ultra-precious hormone, cortisone. Seeds of the yam, yucca, amaryllis and agave families contain microscopic amounts of steroid which is similar to the one which serves as a precursor in the body to the secretion of the adrenal gland.

As rapidly as the seeds are gathered they will be identified botanically and sent to the Northeastern Regional Laboratory of the USDA where chemists will make intensive analyses. The experts have been instructed to gather everything which can be included in the four plant families, no matter how obscure or how remote its location.

Minnesota Reports Cancer

D. S. Fleming, M.D., M.P.H.* and Bernard Wolcyn, Ph.D.†
Minneapolis, Minnesota

MINNESOTA's cancer death rate has shown a slight drop during the last five years, despite the fact that total deaths from cancer appear to be increasing year by year. According to figures compiled by the Minnesota Department of Health, cancer in 1949 claimed the lives of 4,407 people in Minnesota. Of these, 4,168 were residents of the state.

In 1920, only 2,293 deaths in Minnesota were attributed to cancer—about half of the 1949 total. One reason for the tremendous increase in recent years may be the progressive aging of our population; another may be the greater accuracy of diagnosis today. Chart I shows the increase of cancer deaths by occurrence and by residence during the 30-year span since 1920. The line showing deaths by residence is limited by the fact that records were not available before 1941.

A steady but irregular upward trend over the years is depicted in Chart II, which compares cancer death rates for the period considered. In 1920 there were 96.1 deaths per 100,000 population. This rate had risen to 149.4 in 1949, an increase of over 53 deaths per 100,000 population. It will be noted, however, that the peak of 156.5 deaths from cancer per 100,000 population was recorded in 1945. The trend since then has been for the death rate to rise and fall irregularly, with a slight overall drop apparent during the last five-year period.

The cancer death rate for Minnesotans is higher than that for the nation as a whole, varying from four to 22 deaths, per 100,000 population, with the difference growing wider as we approach 1950 figures.

The 4,168 Minnesota people who died of cancer in 1949 represented a crude death rate of 140.00 per 100,000 population. In comparison, cancer in 1941 claimed 3,723 lives or 133.5 per 100,000 population. This comparison is also graphed in Chart II.

The trend of cancer deaths for the two sexes in Minnesota from 1940 to 1949 is shown in Chart III. It indicates that deaths of males and females increased in about the same proportion through the greater part of this period, showing that the overall increase in cancer deaths cannot be traced to a predominance of cancers in one sex as compared with the other. One difference is evident, however. Deaths among females dropped during 1949, while those for males remained at the peak established in 1948. Only future observations will determine whether or not this variation indicates a developing trend.

The total number of cancer deaths during the period 1940-49 was slightly higher among men than among women. A total of 38,173 cancer deaths were reported during the period. Of these, 19,844 were among males, and 18,329 among females—roughly 52 per cent male mortality as compared with 48 per cent female. These ratios almost exactly reflect the slight excess of males to females in the general population in Minnesota. One fact, however, may be worth noting. A study made by the Minnesota Department of Health recently indicated that more women than men with suspected cancer present themselves for medical examination, and they do so earlier in the course of the disease.

Chart IV pictures the trend of deaths from cancer in males and females according to the four leading sites of the neoplasms. Cancer of the digestive organs and

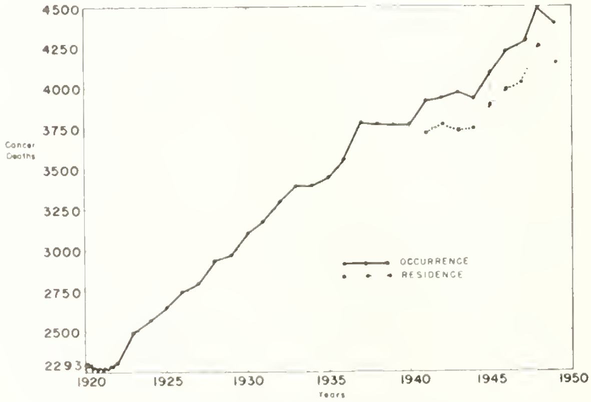

Chart I CANCER DEATHS FOR MINNESOTA
by Residence and Occurrence

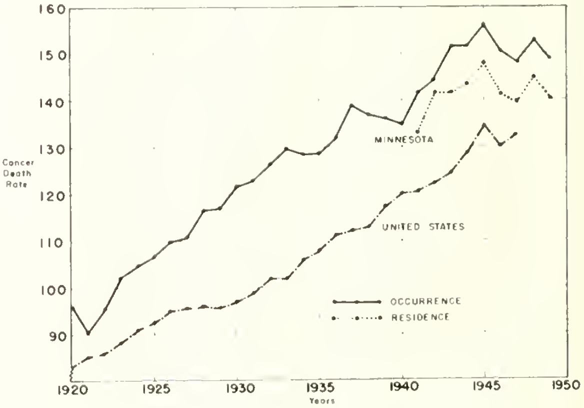

Chart II CANCER DEATH RATES PER 100,000 POPULATION
FOR MINNESOTA AND THE UNITED STATES
by Residence and Occurrence

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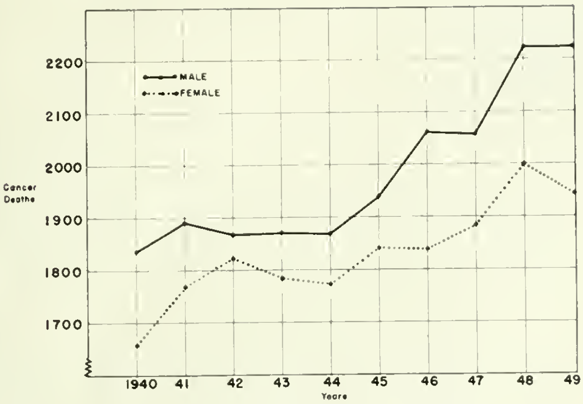

Chart III CANCER DEATHS FOR MINNESOTA males and females by residence

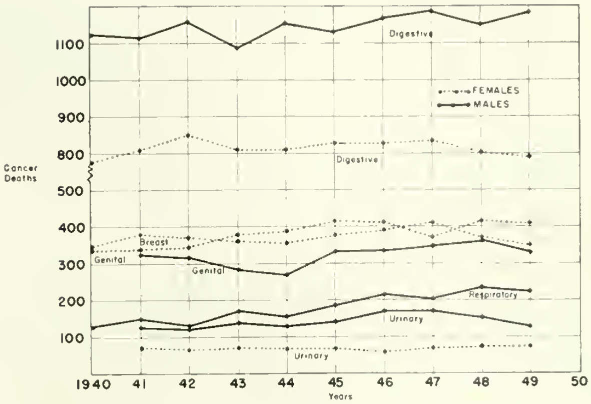

Chart IV CANCER DEATHS FOR MINNESOTA according to the four leading sites

the peritoneum has continued through the years to claim more lives than cancer at any other site. This holds true for both sexes. Breast cancer ranks second highest for females, while the genital system, according to Graph IV, holds second position for males.

The interesting point to notice in this chart is the slow but steady increase of deaths from cancer in the four leading sites. The rise for males is slightly more pronounced than that for females. In the case of digestive tract, breast, and urinary tract cancers for women, the trend has leveled off with a tendency toward a decline.

SUMMARY

A review of the past 30 years shows a steady increase in numbers of cancer deaths. However, the death rate per 100,000 population has dropped slightly during the past five years.

Deaths from cancer show the same proportional increase over the years for males as for females, with a higher cumulative total for males.

Digestive organs continue to be the leading sites of cancer claiming lives of both males and females. However, breast, urinary tract and digestive tract cancers in females show very little or no increase during recent years.

CANCER BY COUNTRY

(A report from the Fifth International Cancer Congress, held in Paris July 6, 1950)

A section of the congress was devoted to discussions of home town cancer problems and experiences. Much of the information given could be used by physicians all over the world; and some of the talks, while not specifically aiding the cancer fight in the United States, certainly should make us count our blessings. For example Dr. K. M. Rhai, of India, reports that in his country the cancer problem seems almost insurmountable because of the ignorance and poverty of the people and the lack of proper equipment. In all of India, there are but two cancer hospitals, about 50 x-ray machines, and less than ten grams of radium. This for one of the heaviest populations of the world.

More optimistic were reports from Egypt. There, according to Dr. M. A. Afifi, the cancer death rate varies from 14.5 per 100,000 for native Egyptians to 64.8 for foreign born groups. The death rate is lowest among the Moslems, next for the Christians, and highest among the Jews. Dr. H. Barsoum says that cancer of the stomach is very rare in Egypt, as are peptic ulcers. He found only 13 peptic ulcers in 1,250 autopsies. Cancer of the gall-bladder, penis, clitoris, and industrial cancers have a much lower incidence in Egypt than in other countries. However, bilharzial cancer of the bladder is very prevalent, comprising about 22 per cent of all reported carcinomas.

In Denmark, Drs. J. Clemmensen and A. Nielsen studied the statistics of incidence and mortality. They found that in various areas throughout the city of Copenhagen the incidence of cancer of the cervix increased proportionally with decrease in rent; the lowest economic areas have the most cervical cancer. However, cancer of the breast fell into exactly the opposite category, with the highest economic areas having the most breast lesions.

—*The Cancer Bulletin,* July-August, 1950.

Book Reviews

The Physiological Basis of Medical Practice, by CHARLES H. BEST, M.D., and NORMAN D. TAYLOR, M.D. Revised and reset; 5th edition, 1330 pp. including index. Baltimore: Williams & Wilkins Co., 1950. $11.00.

Best and Taylor have written their book with the purpose of relating laboratory and experimental physiology to human clinical problems confronting the medical student. Because of this circumstance, the text is especially suitable for the active practitioner who has forgotten much that he learned in school. And, actually, what he learned as a student of physiology would now be of little use.

The necessity for the issuance of five editions of a standard textbook within a period of 13 years attests to the rapid increase of the accredited knowledge of the subject. And for the fifth edition, the material has been revised and new added, and the type for the volume reset.

The discussions of the several organs and systems are arranged as in the previous editions; that is, description of morphology and nerve and blood supplies are given, then the normal physiologic activities are explained, and finally the derangements of function associated with particular diseases are clearly and simply explained. All of this is, truly, applied physiology.

Pertinent published literature has been thoroughly digested, and only important references appear in the text. Laboratory procedures of proved practical value are set out in detail. The index is adequate. J. B. C.

Thrombosis in Arteriosclerosis of the Lower Extremities, by EDWARD A. EDWARDS, M.D., F.A.C.S. Springfield, Illinois: Charles C. Thomas, 1950. $2.00.

This little book, a part of the American Lecture Series, presents deductions and findings on correlation of clinical data with pathologic findings. There are excellent chapters that deal with the etiology, pathology and clinical picture and treatment of thrombosis associated with arteriosclerosis of the lower extremities. For the general practitioner and the specialist it is an excellent, concise little book of 70 pages. For those of us who have agreed that a better approach than amputation is in order for the problem of thrombosis associated with arteriosclerosis of the lower extremities, this little monogram is excellent. For those of us interested in the problem of blood clotting in arteriosclerosis of the lower extremities it is also a *must*. The book brings out the importance of thrombosis secondarily to arteriosclerosis as a causative feature in gangrene and of seriously impaired function. It is noteworthy that emphasis is placed on the ability to make diagnoses without special instruments or laboratory procedures.

The book is of convenient size, well printed and easy to read. The diagrams and illustrations are clear and conveniently placed.

I. D. B.

A Primer for Diabetic Patients, by RUSSELL M. WILDER, M.D., Division of Medicine, Mayo Clinic. Ninth edition, 200 pages, illustrated. Philadelphia: W. B. Saunders Company, 1950. $2.25.

As every practitioner knows, it is not enough to inform a patient as to the nature of his chronic illness, but it is equally important to teach him how to live with that disease. This is particularly true in the case of the patient with diabetes, where control is a day-by-day affair and where the patient must be his own mentor and sometimes his own diagnostician.

This primer for diabetic patients, now in its ninth edition, supplies that information in a compact and readable volume. A short background of diabetes is given, and the reasons for the necessary strict regimen. In subsequent chapters the patient is instructed in tests for sugar and diacetic acid, the self administration of insulin, the complications of diabetes and how to avoid them, the regulation of diet and how to plan and calculate meals. The text is amplified with charts, and drawings and photographs.

V. L. D.

Textbook of Gynecology, by ARTHUR HALE CURTIS, M.D., and JOHN WILLIAM HUFFMAN, M.D. Philadelphia: W. B. Saunders Co., 1950. 709 pages. $10.00.

The new enlarged sixth edition of Curtis's *Textbook of Gynecology,* in which Huffman has assisted the senior author with the newer clinical procedures and drugs, continues to be an excellent textbook of gynecology. Many new ideas and suggestions gleaned from recent literature have been incorporated in the text. However, the advances in new drugs and their dosages are so rapid that the dosage schedules advocated in the text appear inadequate today—(e.g.) 12 doses of 25,000 units penicillin in the treatment of acute gonorrhea. The chapter on gonorrhea in the female, of some thirty pages, occupies a prominent portion. Maybe in the future gonorrhea will, like typhoid in textbooks of medicine, be relegated to a minor part of any textbook of gynecology.

This textbook teaches clinical gynecology. Concerning hysterectomy it is noted that the "relative merits of supravaginal and complete hysterectomy scarcely warrant the emphasis placed on the subject," but in competent hands "the healthy cervix should also be removed at the time." The chapter on uterine hemorrhage, while not ultrascientific in the approach, is preeminently practical in its teaching, with the clinical approach stressed throughout. The pitcures are clear and well chosen.

This new edition is an excellent textbook for medical students—especially for those planning to go into general practice. For the general practitioner it provides a needed reference in the treatment of diseases of women. This latest edition provides the gynecologist also with readily available information and should be included in his library.

C. H. McK.

Cerebral Palsy Equipment, prepared and published by the National Society for Crippled Children and Adults, Inc. Chicago, Ill., 1950. 268 plus xii pp. Illustrated. Loose-leaf manual. $3.75.

For the benefit of the country's estimated half million cerebral palsy victims, the National Society for Crippled Children and Adults with the sponsorship of Zeta Tau Alpha, national fraternity for women, has published a manual of equipment and aids for the care and treatment of the cerebral palsied.

The manual contains information regarding use, half-tone illustrations, working diagrams for construction, specifications, materials and directions for making 127 items of equipment and aids for physical therapy, occupational therapy, speech therapy and special education.

The manual was compiled under the guidance of leaders in the American Academy for Cerebral Palsy, the professional organization of medical specialists in cerebral palsy. On their recommendation, distribution is restricted to physicians and professional personnel working closely with the cerebral palsied.

Distribution of the manual is through the National Society for Crippled Children and Adults, Publications Section, 11 S. LaSalle St., Chicago 3, Illinois.

The JOURNAL LANCET

Official Journal of the American College Health Association
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Editorials

THE PROPOSED PREVENTIVE HEALTH CLINICS FOR NORTH DAKOTA

Considerable interest has been developed in the last several years in the fast growing field of chronic illness from the public health standpoint. So far the health planning to meet this increasing situation has been limited to a few experimental areas or to a few of the essential phases of a complete chronic disease program. As everyone knows, chronic disease effects practically every family. It has been estimated that each year in the United States chronic diseases cause nearly one million deaths and over one billion days of disability. Measured in any terms, chronic diseases are rapidly causing a major new source of insecurity, an excess loss of national income and will become a staggering, national burden unless something is done about it.

In North Dakota, on a preliminary survey of hospital facilities, it was found that nearly 50 per cent of all hospital beds available are being occupied by persons 50 years or older. Of these, approximately 50 per cent are filled with patients considered to have an acute or remedial illness. The other 50 per cent are occupied with a chronic or non-remedial illness. In 1900, in North Dakota, major chronic diseases were responsible for less than 30 per cent of all deaths reported in registration areas. In 1940, they were responsible for 59.2 per cent while in 1949 they accounted for 64.1 per cent of all deaths in this state. In 1900, one person in 25 was 65 years of age or over. In 1940, one person in 16 was 65 years of age or over. In 1949, one person in 14 was older than 65 years and, projected into 1980, one person in 10 will have attained the age of 65 years or more. If this trend continues, by 1980 total deaths from heart diseases, diabetes and cancer will be almost double what they were in 1940. Obviously, with the increased prevalence of diseases which cause prolonged disability and extended social and economic dependency, there will be in turn a need for increase in both medical and hospital facilities and a greater demand for more social and economic assistance.

In June, the State Health Council of the North Dakota State Department of Health approved of the development of preventive health clinics primarily established for chronic illness. This was in turn approved by the North Dakota Medical Association and by the Hospital Association. The basis of the proposed preventive health clinics is a fundamental approach that has been used successfully in other types of health programs such as mass x-rays for tuberculosis, the mass survey for diabetes and certain cancer detection work. It is our belief that one simple answer to the partial control of the health aspects of the aged is the development of preventive health clinics, more commonly known as the multiple screening program. This screening clinic for chronic diseases is an attempt to bring to bear on a single individual at a specified time certain technical screening tests that are specific in their results, are relatively inexpensive to perform, and preferably do not require the immediate presence of a physician. The tests are objective and furnish the diagnosing physician to whom the individual is referred valuable data upon which to base his decisions as to the patient's condition. The program is interested primarily in checking apparently well individuals who are not under a physician's care.

It appears logical that when apparently well persons come in for a routine screening test, such as a chest x-ray, that other tests for chronic diseases could easily be performed at the same time. Early findings of indications of chronic diseases through the tests, plus the referral to physicians for diagnosis and follow-up should be invaluable in a chronic disease program. The individual will benefit from early treatment and at a time when he is still economically independent.

A program in North Dakota is to be designed to fit within multiple county district health departments so that a continuous revolving program can be established and participants may be re-examined every 12 to 18 months. The preventive health clinic, then, is to be a focal point from which the North Dakota State Department of Health and all other interested individuals can develop the related facets that are apparent in a chronic illness program, such as research, medical care, convalescent and nursing home care, rehabilitation care and the development of the entire field of geriatrics.

RUSSELL O. SAXVIK, M.D.,
North Dakota State Department
of Health, Bismarck, No. Dak.

CHANGING ASPECTS OF MENINGITIS

Meningitis has always been a serious disease, particularly in infancy and early childhood, the period of life in which it is most common. Many physicians can recall the day, not so long past, when a diagnosis of meningitis due to any organism but the meningococcus foretold a hopeless prognosis.

With the advent of the sulfonamide drugs, cases of recovery of patieints with meningitis due to the streptococcus, staphylococcus, pneumococcus, E. coli, and even Hemophilus influenzae began to appear in the literature with increasing frequency. The prognosis of meningococcus meningitis, already favorable as a result of the use of anti-meningococcus horse serum and antitoxin, was still further improved. The combined use of sulfonamides and Alexander's specific rabbit antiserum brought the mortality rate of influenzal meningitis down to less than forty per cent.

Penicillin was the next important addition to treatment. It was found to be effective in meningitis due to the meningococcus, pneumococcus, staphylococcus, and streptococcus. Used alone or in combination with sulfonamides its use has lessened the mortality rate to a further degree. Penicillin is given intramuscularly, intravenously, or intrathecally. There is considerable argument as to the necessity and advisability of intrathecal administration. It seems likely that the intrathecal route is safe if the amount and dilution of penicillin is carefully regulated.

Streptomycin is the first drug to offer a hope for cure of tuberculous meningitis. A combination of intramuscular and intrathecal administration for a period of months has resulted in a number of complete cures although failure is probably still as frequent as success as an end result. Toxic symptoms of streptomycin are common, consisting of deafness, ataxia, nystagmus, strabismus, vomiting and rashes. Promizole is often given orally concurrently with streptomycin in tuberculous meningitis and seems to augment its therapeutic effect. Recent reports indicate that intrathecal tuberculin may resolve incipient subarachnoid block. In cases in which block develops ventricular drainage must be established, sometimes by surgical means. Streptomycin is also effective in treatment of influenzal meningitis and E. coli meningitis. It is usually given in combination with other therapeutic agents.

During recent months aureomycin intravenously and orally has been found to be an efficient agent against meningitis due to both gram positive and gram negative organisms. Terramycin will no doubt be equally effective. Chloromycetin orally and rectally is effective against gram negative organisms. Judging from preliminary reports it seems possible that these antibiotics may eventually supplant other drugs in the treatment of most forms of meningitis. For the present, it would seem best to use more than one therapeutic agent in the treatment of all forms of meningitis except possibly meningococcic meningitis.

It is important to make a diagnosis of meningitis as soon as possible, as early treatment is more effective than that started later in the disease. Diagnosis is usually easy in the older child or adult in which the classical symptoms and signs are present, consisting of headache, high fever, chills, vomiting, stiff neck, positive Kernig and Brudzinski signs, positive Babinski signs and extreme irritability often with cloudy sensorium or convulsions. In infancy, however, the typical signs and symptoms do not always appear. One is justified in resorting to early spinal puncture in any doubtful case as it is a harmless procedure when done with proper precautions. It is also best if possible to withhold chemotherapy or antibiotic therapy until blood culture, spinal fluid culture, and throat culture have been taken. Otherwise one may be forced to treat a critically ill child without definite knowledge as to what drug or drugs would be most specific.

One must always remember to treat the patient as well as the disease. Any seriously ill child with an acute infection needs fluids, nourishment either orally or parenterally, sometimes blood transfusions, oxygen, sedation or stimulants, and always good nursing care. By constant attention to the needs of patients in these respects as well as with regard to proper kinds and amounts of antibiotic, chemotherapeutic and other therapeutic agents, chances for cures of meningitis are constantly improving.

Lest one assume too optimistic an attitude regarding meningitis it is well to point out that even with more effective treatment at the present time it is still an extremely serious disease. In early infancy particularly the prognosis for life is hazardous, and even though the infant survives neurological sequelae are frequent.

L. G. Pray, M.D.,
Fargo Clinic,
Fargo, North Dakota

AMERICAN ACADEMY OF NEUROLOGY ANNOUNCES OFFICIAL PUBLICATION

As a reflection of the proved recognition of neurology as an integral and essential part of medicine the American Academy of Neurology announces the establishment of its new publication, *Neurology,* the first issue of which will be mailed January, 1951.

Neurology, the only American journal devoted exclusively to neurology, will be published bi-monthly. Its editorial scope will embrace every aspect of clinical neurology including diseases of the nervous system, neuropathology, neurosurgery, neuroanatomy, neurophysiology and neuropsychiatry.

The Academy's board of editors consists of editor-in-chief, Russell N. DeJong, M.D., professor and chairman of the department of neurology, University of Michigan; associate editor, Webb Haymaker, M.D., chief of neuropathology, Armed Forces Institute of Pathology, Washington, D. C.; and an editorial board made up of Raymond D. Adams, M.D., assistant professor of neurology, Harvard University; Pearce Bailey, M.D., chief of neurology, Veterans Administration, Washington, D. C.; Francis M. Forster, M.D., professor and director of the department of neurology, Georgetown University; Mabel G. Masten, M.D., professor of neuropsychiatry, University of Wisconsin; Paul F. A. Hoefer, M.D., associate professor of neurology, Columbia University; Richard B. Richter, M.D., professor of neurology, University of Chicago; Alphonse R. Vonderahe, M.D., associate professor of anatomy (neurology), University of Cincinnati; A. Earl Walker, M.D., professor of neurosurgery, Johns Hopkins University; Robert Wartenberg, M.D., associate clinical professor of neurology, University of California; and Paul I. Yakovlev, M.D., clinical associate professor of neurology, Yale university.

Under the editorial guidance of the Academy's own board, publishing will be by Lancet Publications, Inc., Minneapolis, publishers of the *Journal-Lancet* and, more recently, of *Geriatrics,* the journal of the American Geriatrics Society.

News Briefs

North Dakota

SEVERAL North Dakota communities took an active part in the third national Diabetes Week, November 12 to 18, during which five million people in the country reported for free diabetes tests.

Dr. Charles M. Graham, chairman of the Committee on Diabetic detection in Grand Forks, was assisted by Dr. Robert Paintor, Dr. John Ruud and Dr. T. Q. Benson, president of the state diabetes association. Also conferring with them were Dr. C. J. Hamre of the University of North Dakota and Dr. E. A. Haunz, chairman of the state committee.

Dr. R. C. Weible and Dr. L. E. Wold led the drive in Fargo, assisted by Drs. A. C. Fortney, George Ivers, C. M. Hunter, B. A. Mazur, F. T. Lytle and J. F. Schneider. Dr. William A. Stafne, a member of the state committee on diabetes, also helped in the Fargo drive.

* * *

MORE THAN 600 persons attended the initial promotional dinner held on October 27 in Bismarck in a drive to raise $500,000 for a second addition to the Bismarck hospital. Dr. Morris Fishbein of Chicago and Governor Fred G. Aandahl of North Dakota were featured speakers at the banquet.

Dr. Fishbein emphasized that none of the best strides medicine has made in the past 50 years would have been possible without corresponding improvements in hospital service. Dr. Aandahl stressed the fact that while there is a present need for additional hospital facilities the need is apt to become greater as the agricultural and industrial economy of the area expands.

* * *

DR. M. G. PETERMAN, professor of pediatrics at Marquette university, spoke at a dinner meeting of the Northwest District Medical society at Minot on October 27. His subject was the febrile convulsions in children.

* * *

DR. N. O. BRINK of Bismarck was made a fellow of the International College of Surgeons at their recent meeting in Cleveland, Ohio. Dr. Brink has been an assistant fellow for two years and during the past year served as vice regent for North Dakota.

* * *

DR. E. H. RICHTER, formerly of Hunter, has accepted a position on the staff of the State Hospital at Fergus Falls, Minnesota.

* * *

DR. CLIFFORD W. HOGAN has joined the staff of the DePuy-Sorkness clinic at Jamestown. A graduate of the University of Minnesota medical school, Dr. Hogan took his internship at the Rochester General hospital in Rochester, New York, and specializes in orthopedic surgery.

* * *

DR. ELLIS OSTER of Hays, Kansas, has established a practice in Mandan. A native of North Dakota, Dr. Oster received his medical degree from the University of Illinois and served for more than two years in the army medical corps.

DR. A. C. GRORUD, who has been a specialist in internal medicine with the Quain and Ramstad clinic in Bismarck, has accepted a position in a clinic in South Bend, Indiana.

* * *

THE CAUSE and treatment of multiple sclerosis was discussed in Bismarck on October 16 by Dr. J. Wayne McFarland of Washington, D. C. In his talk he expressed hope that a rehabilitation center for multiple sclerosis patients would be set up in Bismarck.

* * *

DR. YUKIO TSUMAGARI, who has been assistant pathologist at the Cook county hospital in Chicago, took over his new duties as assistant professor of pathology at the University of North Dakota medical school in October.

Minnesota

DR. HENRY W. MEYERDING, Rochester, Minnesota, assumed office as president of the United States chapter of the International College of Surgeons, at the meeting in Cleveland on Friday, October 27. Dr. Meyerding is an emeritus member of the Mayo clinic staff and professor of orthopedic surgery in the Mayo Foundation.

* * *

MINNESOTA doctors who presented papers at the Cleveland meeting include Dr. Thomas J. Kinsella, Minneapolis, Dr. John S. Lundy, Dr. Gershom J. Thompson, Dr. Virgil S. Counseller, Dr. Deward O. Ferris, and Dr. Louis A. Buie, all of Rochester.

* * *

DR. OWEN H. WANGENSTEEN, head of the surgery department of the University of Minnesota, was elected regent of the American College of Surgeons at their recent meeting in Boston. Dr. James T. Priestly, of Rochester, was named to the board of governors.

* * *

DR. WANGENSTEEN headed the postgraduate gastroenterological course, held under the auspices of the National Gastroenterological Association at the Hotel Statler in New York City on October 12, 13, 14, 1950.

* * *

Dr. Philip S. Hench and Dr. E. C. Kendall of Rochester were named joint Nobel prize winners with Dr. Tadeusz Reichstein, professor of chemistry at the University of Basel. All three have contributed to medical science with their work on cortisone and ACTH.

* * *

DR. W. F. BRAASCH of Rochester was named president of the Minnesota Public Health Association at its annual meeting in October.

* * *

FIFTEEN PHYSICIANS of the Range area met Thursday, October 19, at the Pioneers' Infirmary at Virginia for the fourth of eight sessions of the postgraduate course presented by faculty members of the University of Minnesota. Dr. Ben Sommers discussed "The Diagnosis and Management of Coronary Disease." Dr. Rodney F. Sturley spoke on "Gynecological Cancer."

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DR. WILLIAM P. SHEPARD, president of the American Public Health association, gave the principal address on November 6 at the dedication dinner for the new student health services building at the University of Minnesota. His topic was, "Student Health and Public Health."

Deaths

DR. ARTHUR J. PATEK, 81, founder of the *Wisconsin Medical Journal*, past president of the Wisconsin State Medical society and winner of its 1935 distinguished service award, died early in October at Milwaukee, Wisconsin.

DR. RUDOLPH J. WIESELER, Sioux Falls physician, died on October 11 after a nine-month's illness. Dr. Wieseler was a graduate of the Creighton university school of medicine and a member of the South Dakota Medical Association.

DR. JOHN P. BARBER, who had practiced medicine in Minneapolis for 50 years, died October 13. A graduate of the Louisville (Kentucky) medical school, Dr. Barber came to Minneapolis in 1886 and practiced medicine there until his retirement in 1938. He was a former staff member of St. Mary's and Deaconess hospitals.

DR. E. E. SHRADER, Watertown, Minnesota, died October 21. He came to Watertown in 1893 and served as physician there for more than 50 years.

DR. GUSTAF W. DAHLQUIST, who had practiced at Lancaster, Minnesota, and Fargo, North Dakota, prior to his retirement, died October 25 at the Minnesota Soldiers Home. He served as an army lieutenant in World War I and was a member of the veterans bureau at Fargo.

DR. ERNEST S. MARIETTE, former superintendent of Glen Lake sanatorium, Oak Terrace, Minnesota, died Sunday, October 29.

A LEADER in the treatment of tuberculosis, Dr. Mariette served as head of the sanatorium from 1916 until his retirement in 1949. Dr. Mariette was a past president of the Minnesota Trudeau society, Hennepin County Tuberculosis Association, Minnesota Sanatorium association, Minnesota Hospital association, Mississippi Valley Conference on Tuberculosis and Mississippi Valley Trudeau society.

DR. CHARLES B. LENONT, pioneer doctor who practiced on the iron range for nearly 50 years, died at Virginia on November 6. Dr. Lenont was a graduate of the University of Minnesota medical school, and during his practice on the range founded the Lenont hospital at Virginia and was a co-founder of the Lenont-Peterson clinic.

DR. R. C. RADABAUGH of Hastings died in a hospital in St. Paul November 24, 1950. Dr. Radabaugh, a graduate of the University of Illinois medical school, practiced medicine at St. Paul and Hastings since the end of World War I.

Notices

Doctors who will participate as faculty members in a continuation course in *clinical neurology* to be presented by the University of Minnesota at the Center for Continuation Study from January 29 to February 10, 1951, are as follows: Dr. Pearce Bailey, Georgetown University School of Medicine, Washington, D. C.; Dr. H. W. Magoun, University of California Medical School; Dr. Henry Schwartz, Washington University School of Medicine, St. Louis; and Dr. S. Bernard Wortis, New York University Medical Center. Dr. Magoun will also deliver the annual J. B. Johnston lecture on the subject, "Wakefulness and Sleep."

* * *

The University of Minnesota announces a continuation course in *clinical chemistry,* December 7-9, 1950. Throughout the course emphasis will be placed on clinical chemistry in the diagnosis and management of medical problems. Dr. John T. Merrill, Harvard University, Boston, will be the visiting faculty member for the course.

* * *

The first of a series of seven sectional meetings of the *American College of Surgeons* will be held in St. Louis on January 22 and 23, with headquarters at the Hotel Statler. The other six section meetings will be held in Hot Springs, Virginia, February 26 and 27; Philadelphia, March 5 and 6; New Haven, March 16 and 17; Portland, Oregon, March 26 and 27; Denver, April 6 and 7, and Detroit, May 10 and 11.

On the day following the sectional meeting in St. Louis, January 24, a full day of clinics will be held in St. Louis hospitals for the visiting surgeons.

* * *

The Board of Regents of the *American College of Chest Physicians* offers a cash prize award of $250 to be given annually for the best original contribution, preferably by a young investigator, on any phase relating to chest disease. The following conditions must be observed:

1. Five copies of the manuscript, typewritten in English, should be submitted to the executive office of the College, 500 North Dearborn Street, Chicago 10, Illinois, not later than April 1, 1951.
2. The only means of identification of the author or authors shall be a motto or other device on the title page and a sealed envelope, bearing the same motto, or device on the outside, enclosing the name of the author or authors.

* * *

The South Central Branch of the *American Urological Society* holds its Seminar in Dallas at the Adolphus Hotel, January 29 through February 2.

* * *

A continuation course in *obstetrics* will be presented at the Continuation Center on December 15 and 16. Visiting faculty members for the course will include: Dr. Emil G. Holmstrom, University of Utah Medical School; Dr. Curtis J. Lund, Louisiana State University Medical School, and Dr. Charles E. McLennan, Stanford University Medical School.

* * *

A continuation course in *ophthalmology* will be held at the Continuation Center on January 22-26, 1951. Dr. Alson E. Braley, head of the department of ophthalmology, University of Iowa, and Dr. A. D. Ruedemann, head of the department of ophthalmology at Wayne University, Detroit, will be the visiting faculty members for the course.

* * *

The *American Dermatological Association* is offering a prize of three hundred dollars for the best essay submitted of original work, not previously published, relative to some fundamental aspect of dermatology or syphilology. Manuscripts are to be submitted in triplicate not later than February 1, 1951, and should be sent to Dr. Louis A. Brunsting, Secretary, American Dermatological Association, 102-110 Second Avenue, S.W., Rochester, Minnesota.

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Basic Principles in General Surgery, Two Weeks, starting April 2.
Gallbladder Surgery, Ten Hours, starting April 23.
Fractures and Traumatic Surgery, Two Weeks, starting March 19.
GYNECOLOGY—Intensive Course, Two Weeks, starting February 19. — Vaginal Approach to Pelvic Surgery, One Week, starting March 5.
OBSTETRICS—Intensive Course, Two Weeks, starting March 5.
MEDICINE—
Intensive General Course, Two Weeks, starting April 23.
Gastro-enterology, Two Weeks, starting May 14.
Gastroscopy, Two Weeks, starting March 5.
Electrocardiography and Heart Disease, Two Weeks, starting March 19.
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Meet Our Contributors

DANIEL BESSESEN is a graduate of the University of Minnesota medical school, took graduate work in anatomy and pathology, practices in Minneapolis. He is a member of Sigma Xi, county and state medical societies, and the Minnesota Surgical society.

★

PAUL S. BLAKE was graduated from the University of Minnesota medical school, is now a fellow in neurosurgery at the University of Minnesota Hospital. He is a member of the Hennepin County medical society.

★

JOE R. BROWN is a graduate of the University of Iowa medical school; took his internship at the Presbyterian Hospital, Chicago; served as neuropsychiatrist for the U. S. Army in World War II; as chief of neuropsychiatry service for the VA hospital, Minneapolis; is now associate professor of neurology at the Mayo Foundation, Rochester. He is a member of several medical societies, and secretary-treasurer of the American Academy of Neurology.

★

DEAN S. FLEMING, a graduate of the University of Minnesota medical school, is now chief of the section of preventable diseases of the Minnesota Department of Health. He is a member of county and state medical societies and the Trudeau society.

★

LYLE A. FRENCH is a graduate of the University of Minnesota medical school, is assistant professor of neurosurgery at that school. He is a member of the Minnesota Surgical Society, the Minnesota Neuropsychiatric Society, the Neurosurgical Society of America, the American Academy of Neurology.

★

LAURENCE G. PRAY received his medical degree from the Washington University medical school in St. Louis, specializes in pediatrics in Fargo, North Dakota. He is a member of AMA, American Academy of Pediatrics, the North Dakota Pediatrics Society, the Northwestern Pediatric Society, the North Dakota State Medical Association. He is a licentiate of the American Board of Pediatrics.

★

E. H. SAKAL received his Ph.D. from the University of Liverpool, specialized in medicinal chemistry, is senior scientist at the Warner Institute for Therapeutic Research, New York City. He is a fellow of the Chemical Society of London, a member of the American Chemical Society, the AAAS, and Sigma Xi.

★

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★

EDWIN JOHN TANQUIST took his medical degree from the University of Minnesota Medical School, took his internship at Swedish Hospital in Minneapolis, practices medicine at Alexandria, Minnesota. He is a member of the AMA, the Park Region medical society, the Minnesota state medical society, is a former president of the county medical society.

★

BERNARD ANTHONY WOLCYN is a graduate of the University of Minnesota, took his Ph.D. at New York University, specializes in public health, is education consultant of the Division of Cancer Control and Heart Disease of the Minnesota Department of Health.

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SAMUEL ZINBERG is a graduate of the University of Minnesota Medical School, took his internship at Minneapolis General Hospital, was teaching assistant in the department of physiology at the University of Minnesota, is now a resident in surgery at the Minneapolis VA hospital. He is a member of Sigma Xi.

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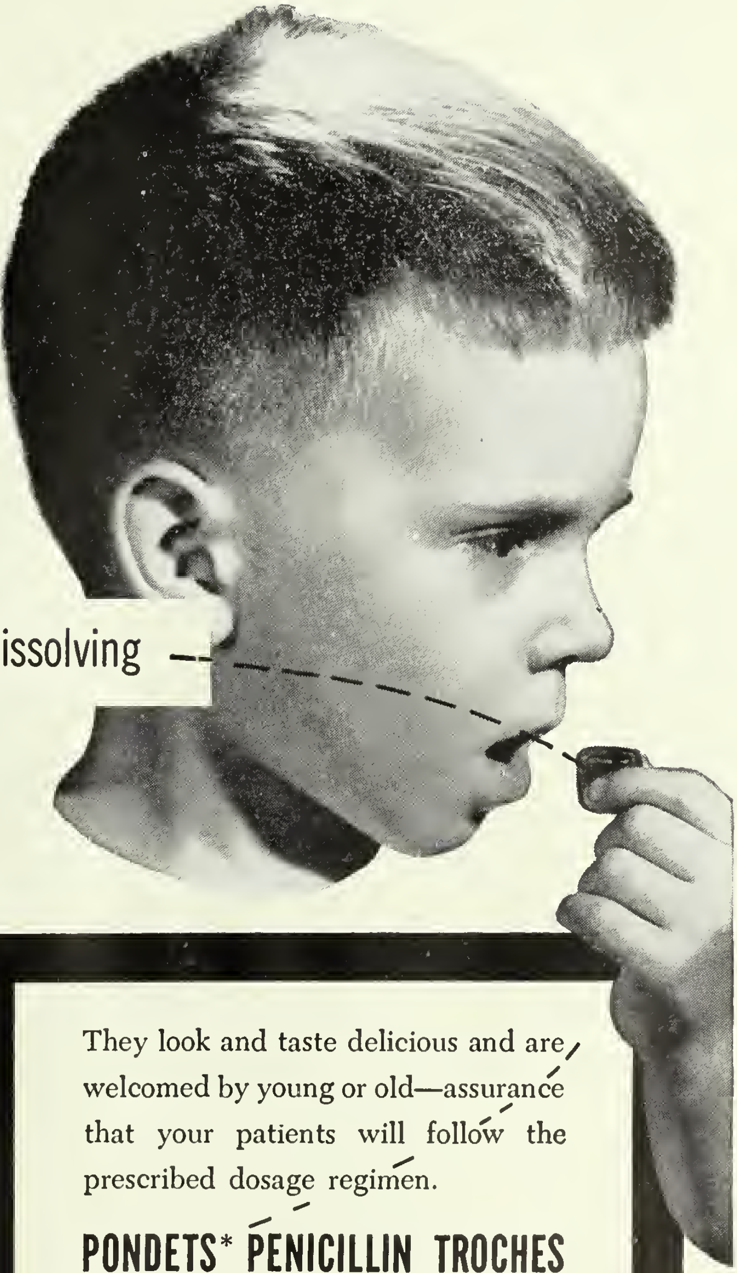

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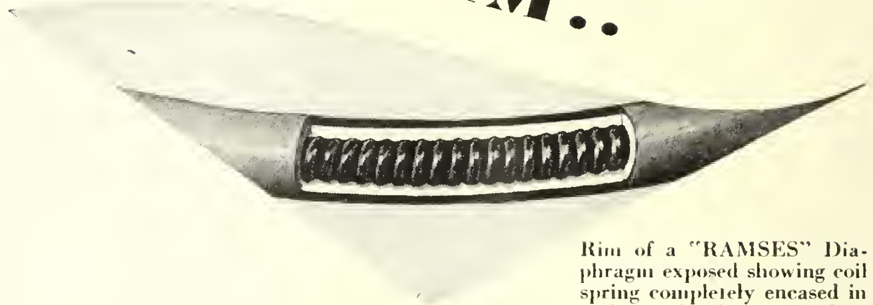

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